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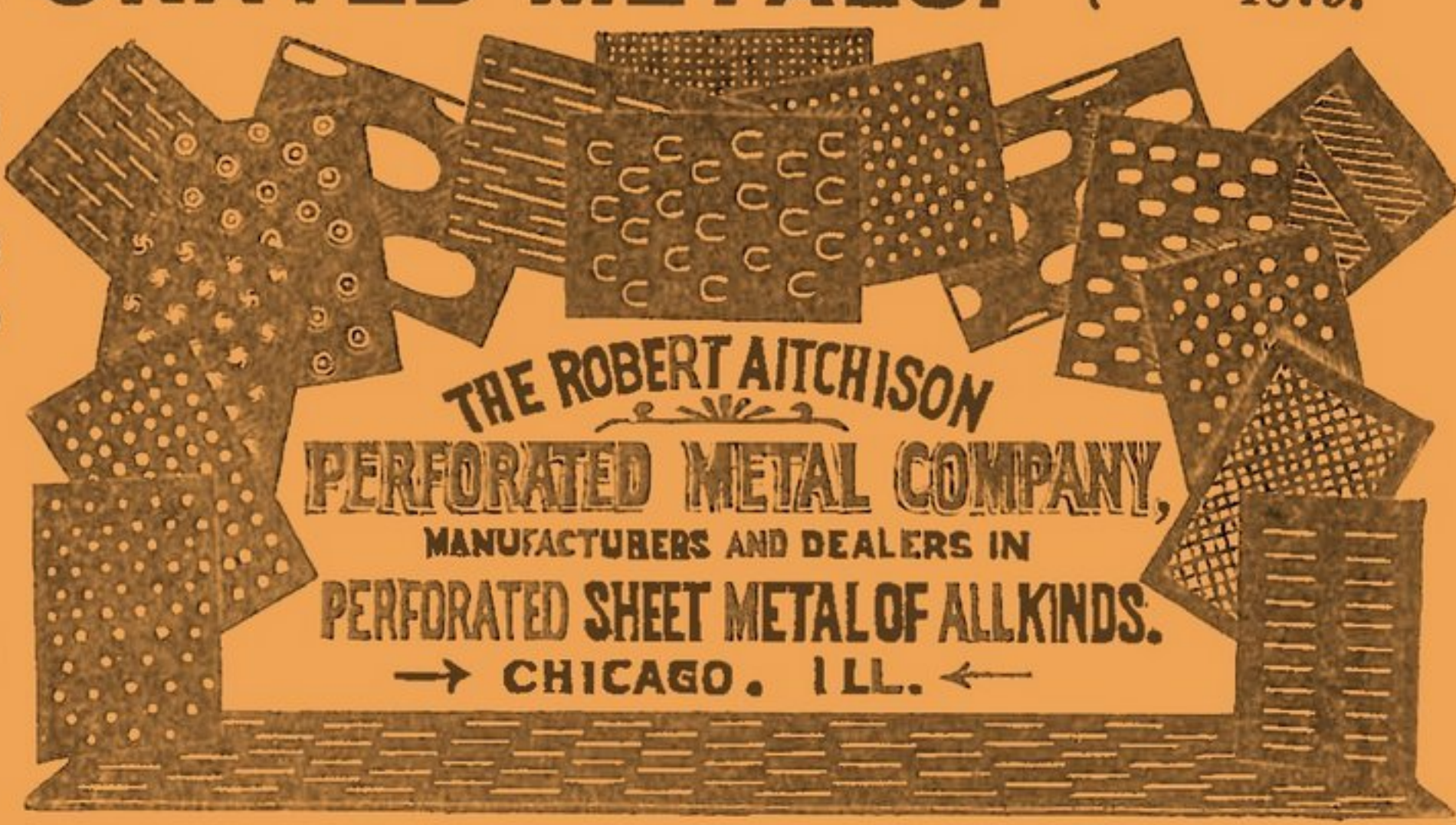
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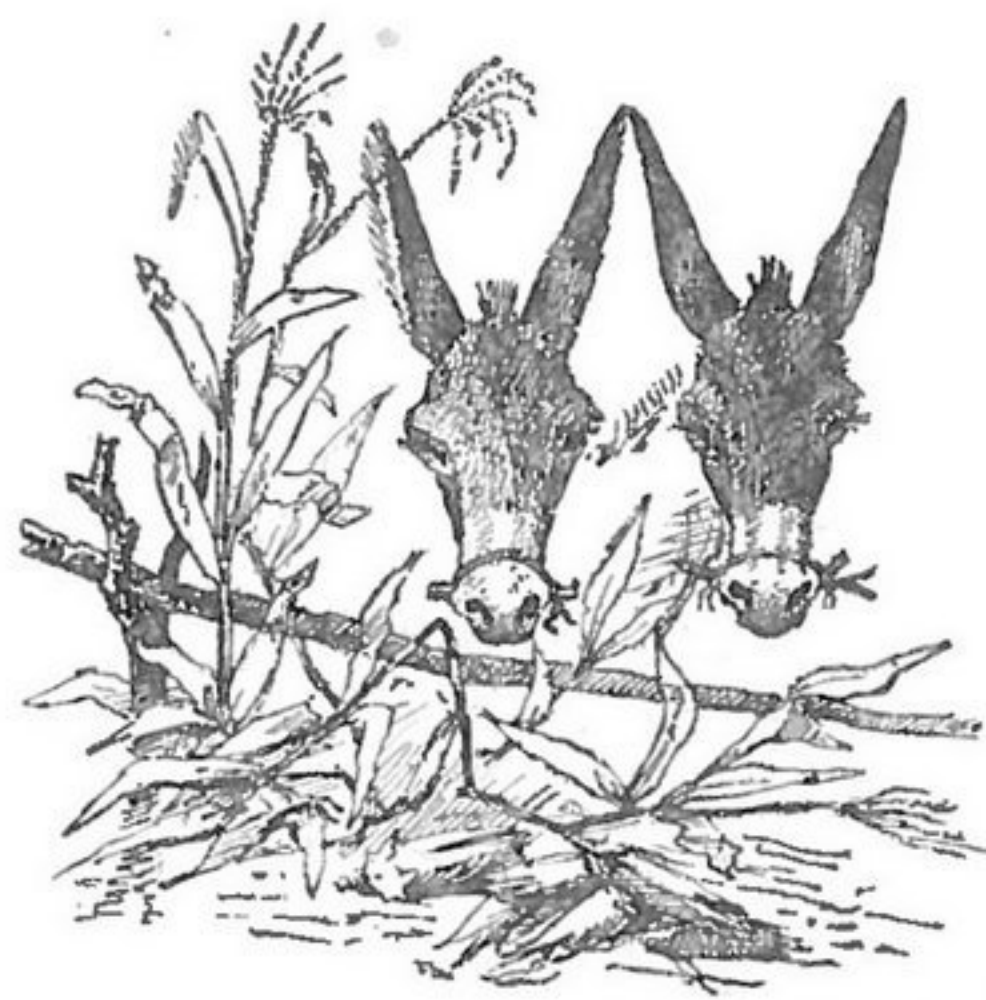
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ZUÑI BREADSTUFF—VI.

Corn-Raising; or, "The Regeneration of the Seed."

FRANK H. CUSHING.



HEN the kernels have sprouted all through the field described in the last chapter, we find the planter busy inspecting the hills near the prayer-stick. Upon this inspection

hangs the fate—so he thinks—of his cornfield; for if every kernel in each of the six sacred hills has "come out" the crop will be productive. If, on the contrary, one or two of the grains in, for example, the southern hill have not sprouted forth, "Alas!" Part of his crop of red corn will be a failure; will not get ripe before frost time.

Toward noon he is joined by two or three of the women and some of the children of the household, and perhaps by as many neighbors. Wherever a sprout looks yellow, they dig down and kill the little white worm they are sure to find near the root. This is called "grub-finishing." Wherever the plants are very vigorous, they pull up all except four or five of the best, and this is called "leafing" or "leaf-lifting."

The occasion which follows soon and is recurrent twice or thrice during the warm season, is perhaps the jolliest of the summer. It is the "hoeing" or "staving time" as the Zuñis call it in well remembrance of the instruments with which their ancestors hoed, away back in the age of stone. These were crooked, sharp-edged staves of hard wood, shaped not unlike sickles, or better still, short scythes. (See Fig. 6 in May MILLSTONE.) Rude as they were, they seem to have been wonderfully efficacious in the removal of weeds, for the operator, progressing on his knees, swept the scythe-hoe from side to side between the rows of corn, cutting off wide swathes of weeds, just below the surface of the soft yielding soil. The principal drawback to this implement was that it proved equally efficacious in wearying the man who wielded it. Therefore, while with the introduction of iron the heavy hand-wrought hoes affected to-day by the Zuñis displaced the ancient wooden instrument, not so with the name the latter gave to hoeing.

Every night at staving time you will hear women calling in at the doorways as they go the rounds of their husbands' clans, "Shé! To-morrow we stave,"

for only the poorest Zuñis hoe their fields unaided. Next morning a goodly number of the men thus summoned gather at whatever house was represented by the woman who summoned them. Without breakfast they betake themselves to the field and hoe with might and main until about eleven o'clock, then stop to eat luncheon and joke with the girls who brought it down, and who are, true to nature, dressed in regular holiday costume. They have been "grinding" all the morning, in time to the shrill chant of the mistress, or of some old aunt whose back is too stiff for the mealing trough (or who pretends it is) but whose voice is, if possible, shriller than ever. If you look at these giggling, droop-eyed girls, you will see that they are a degree whiter than they were yesterday. They've actually been powdering! Just before starting out with the luncheon each one, warmed and perspiring from the violent exercise at the metate, grabbed up a handful of white meal, rubbed it well between her palms, and applied it evenly all over her face and neck.

When the girls have returned to help cook for the "stavers," the latter resume the work, but now more moderately. Laughing, joking, telling stories of the olden time (not folklore, that is forbidden, for the rattlesnake is abroad!), racing at their task, playing pranks, they are the lightest-hearted laborers you ever saw.

According to these stories, it was not like this in the olden time of which they tell. Many of the laborers of primitive pueblodom were given their tasks which they had to finish under a priest's inspection. Later on (and even that was a long time ago) war originated these hoeing bees (or "staving councils.") They were not then as now light-hearted crowds. Each member of them was like a deer on an open plain, fearful lest every puff of wind should bring sounds or sight of some enemy. Full often the enemy did come. Daring not to attack the terraced town, he hung about the distant fields, seeking vengeance for those of his tribe who had fallen under the knotty clubs of Zuñi. And woe to the workers if they proved but few! Armed even as they worked, brave with desperation, it was rare they ever saw Zuñi again; for the cowardly Navajos rarely came but in swarms. Some of the most thrilling traditions of Zuñi tongue concern these and the harvest days of long ago; and it is with regret that I pass my notes of many a long recital by for the short and perhaps less interesting tale below.

Below the Pueblo of Zuñi westward, in one of the long arms of the valley, there stands, perched upon the summit of a high rock, an ancient tower of stone. You reach the doorway of this solitary little citadel by means of an old log notched at intervals to form rude steps. Entering, you find a neat little room, well plastered, in one corner a tiny fire-place, and opposite a single mealing-slab, while above hangs a

blanket-pole. The cinders yet lie on the hearth-stone, the pole glistens still brightly from its shadowy recess, the meal clings even now to the roughened face of the millstone.

It seems as though only yesterday the fire was kindled, as though its light still lingered along the polished pole, as though the women had but just ceased to ply the *moltna* in the mealing trough and had gone out to watch the wide cornfields or bring water. But it is fifty years since the flames died away on that hearthstone; fifty years a little streak of sunlight has played along the blanket-pole—replacing the fire's ruddy glow; and for fifty years the story has been related at each hoeing, how the woman went out one morning—never to return.

And the half of this tale is already old if you but climb another notched log leading through the trap-door by the chimney into an upper room. There are double port-holes here, which from without seem like the sightless sockets of a crumbling skull. By the light they let in you see that the plaster is broken and stained here and there with dark patches. Splintered shafts and shivered stones lie strewn about—ungathered by those who anxiously searched there fifty summers ago at sunset.

For the little house on the rock once belonged to *Um'-thla-na*—"He of large muscles." He was living there with his family to 'tend the cornfields. The women went out early one morning to get water. No sooner had they neared the distant pool than they heard the tread of many horsehoofs. Then they saw, sweeping down the valley, a crowd of mounted warriors. They dropped their water-jars and fled—one to the neighboring rocks—hours after to appear breathless and fainting at Zuñi; but the younger toward the little tower, the steps of which she never ascended, for, caught up by some wrangling horsemen, wrangling for her possession, she was borne away into years of captivity.

Um'-thla-na heard the rush of the riders, grasped up his war-club, bow and arrows, and not pausing to close the doorway, clambered the step-log in the corner and barricaded the trap-door. Soon the Navajos thronged into the lower room. They snatched the serapes from the blanket-pole, they stole the basket of corn cakes and paper bread. Wild with glee over these delicacies so rare to their roving life, they never noticed the trap-door, but ran out and sat down about the doorway to feast. Alas, *Um'-thla-na*! why did he not keep quiet? Peering out through a port-hole, he saw a big Navajo calmly sitting near the step-log eating a roll of paper bread. He drew an arrow to the head, let fly, and struck so fairly the feasting raider that he uttered never a groan but fell over against the ladder still grasping his roll of *guyave*. Another, sitting near, saw him fall, but ere he could call an alarm he too was pinned with one of *Um'-thla-na*'s arrows. As this one fell, *Um'-thla-na* raised a yell of victory,

"changing his key that the Navajos might think him many." At first the enemy fell back, but when they found there was only one man, they rushed toward the house again. For awhile *Um'-thla-na's* arrows fell so thickly that the hazard of near approach kept the Navajos from charging. Even when his shafts were spent he pulled stones from the wall and broke them against one another, casting them down at the enemy. The port-holes were small and he had to stand quite close to them. Soon an arrow whizzed through one, sticking him in the arm. *Um'-thla-na* clinched his teeth and plucked it out, shooting it back.

Ere long he was wounded in many places and weak from loss of blood, still he stood bravely at bay by the port-holes. One of the Navajos more distant than the rest, saw *Um'-thla-na's* face at the hole. Taking careful aim he let go so cleverly that *Um'-thla-na*, dodging was shot through the neck. He staggered back, falling heavily, then roused himself and sat up against the wall, clutching his war-club. Now the Navajos rushed toward the doorway. Suddenly they fled away, for, behold! coming swiftly across the valley in a cloud of dust was a band of Zuni horsemen. The Zunis pursued the flying Navajos, never thinking of *Um'-thla-na*. At last the poor old man, hearing no sound, pulled some of the arrows from his wounds, broke others off, and slowly, painfully clambered down the step-log, and staggered out into the plain toward Zuni. Fainter and fainter he grew until he swooned by the trail-side. Toward sunset they found him there, those who came to seek. Some staid to tenderly care for him, while others went to search for the young waman. They did not find her, but lying dead on the rocks near the tower were five Navajos. One of them was leaning against the step-log still grasping in his hand a roll of paper bread. *Um'-thla-na* lived to tell the story, but grew worse as the arrow wounds rancored, and "killed himself that he might be divided from pain."

Nobody lives in the little house now. "It is a place of painful thoughts," say the narrators; but it stands always the same, for its builder was "He of large muscles."

At sunset the men file in from the field. The women have spread or rather strung the feast out on the lowest roof. Ten or twelve great bowls in a row, smoking hot with stew, every one as red with chili, as its rising vapors are with the touches of sunset. There is a row of breadstuff, thin as paper, flaky as crackers, red, yellow, blue and white, piled up in baskets down either side of the meat bowls. Outside these, two other rows, this time of blankets and stool blocks. The first man whose head appears up the ladder is besieged with polite invitations to "Sit and eat, sit and eat," from as many pairs of lips as there are women on the house-top. When all are seated, a sacrifice is made to the household fire; up to this time the talking has been rife; now it ceases altogether. Everything except eating seems *tabu* until the feast has disappeared, and the cigarettes are rolled and lighted. Then talking resumes and long into the night continues.

At the second or third hoeing, which takes place usually after one of the late summer rains, they "hill" the corn much as our eastern farmers do. In ancient times a sort of broad pick-axe or hoe made

from the *scapula* of an elk and bound with rawhide to a wooden handle (see Fig. 7 May MILLSTONE) or a hoe of hard wood similarly fastened to the handle and surmounted by a heavy stone (see Fig. 8 May MILLSTONE) were used for this purpose.

Autumn comes and the "corn children" have been taken in to meet their "Father and Mother," the *yā'-po-to* and the *mī'-k'iap-pan-ne*. A while later, another search is made through the field, this time for such corn as gives no promise of ripening. Blanketful after blanketful is picked, husks and all, and carried to some distant wooded hill where the soil is solid. Here, with sharp sticks and hoes, a hole is dug resembling a well, (see illustration.) At the top, it is cut larger around, to the depth of a foot or more and walled up neatly and solidly with sandstone. Below this wall, say a foot, the hole is gradually enlarged toward the bottom, until it embraces a room several feet in diameter and cone-shaped, the apex as it were, being the walled, circular opening. From the windward side of the hill, a trench is dug to a level with the bottom of the excavation. A hole or passage, about two feet in diameter is cut from the end of the trench to the interior. Dry grass, old leaves, pitchy sticks, are thrown in from above, and arranged by a man who has entered through the trench. On top of these wood is piled until the hole is full. The mass is now fired. As soon as the night-wind rises, flames dart upward through the circular

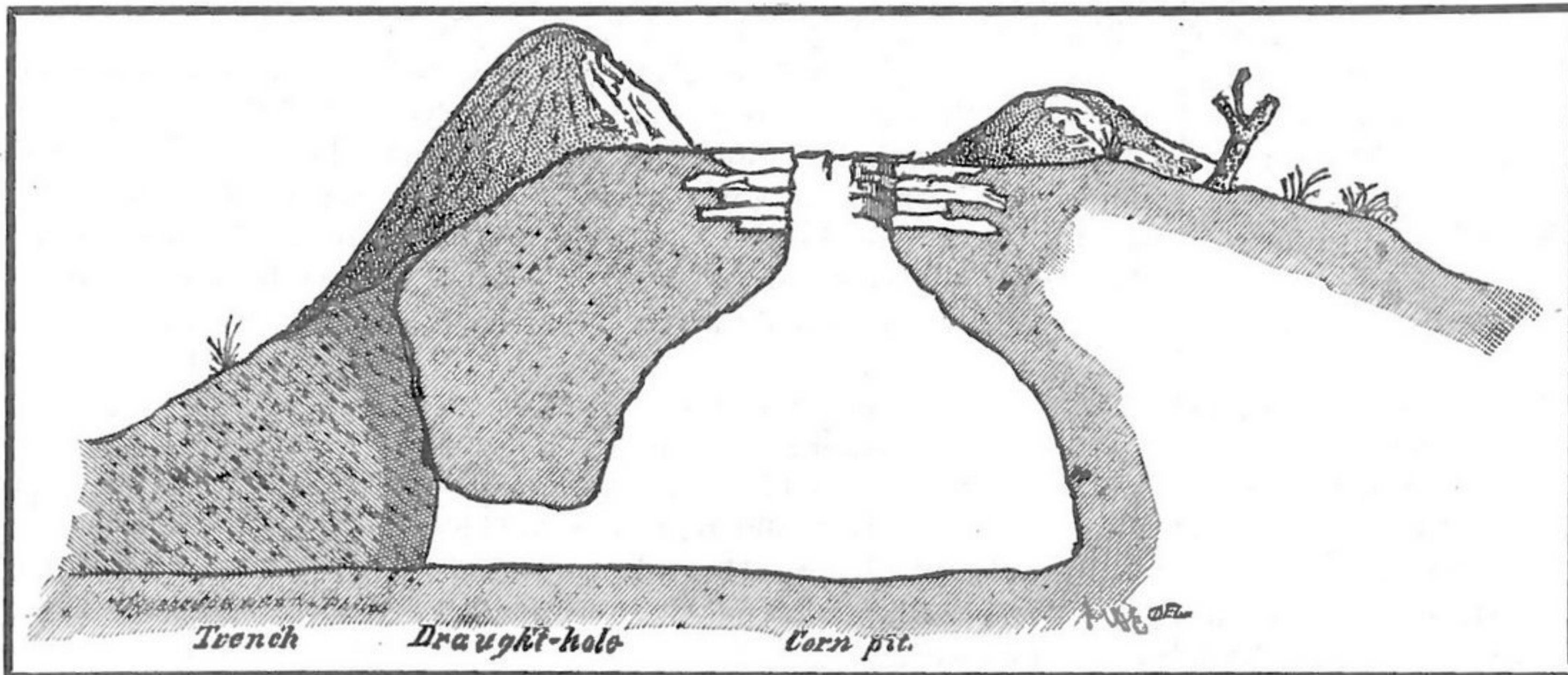
fires, bright enough it is true, but pale compared with the flames of last night, are built at convenient distances. Muffled sounds come all night from buried oven. Sometimes, though rarely, the top is blown off, but usually next morning the mound found unchanged and the sounds have ceased.

Now comes a sight which would surprise a stranger miles away though he might be. The earthen mound is removed and the stopper of corn-stalk with great trepidation, most gingerly pulled out. Instantly, hissing and seething, the steam from heated corn and stalks below, shoots hundreds of feet into the air. On a clear day in green-corn time dozens of these white columns may be seen rising from the wooded slopes around the vale of Zuni. It is not until toward afternoon that the mass is sufficiently cooled to admit of approach. As soon as possible the corn is handed out through the draught-hole (which has been enlarged for the purpose) sewed up in blankets, strapped across *burros* [donkeys] and transported to the town. Every member of the party, as it approaches Zuni, may be seen gorging this—really delicious—baked corn. When it is unloaded into the spare room, the heat has not yet left it. With all possible haste, the husks are stripped down, and the ears, now brown and plump are braided into long bunches, and the whole hung up to dry in an upper room.

Many of the leaves in the field still remain green.

These are gathered, carefully dried and folded into large long bundles for winter kitchen use. Quantities of late squash and pumpkin flowers are stored away in jars to serve a similar end.

As the corn ripens you may see fires burning at almost any of the quaint little farm huts (see illustration), for children or very old men watch there day and night, to keep crows, coyotes, and *burros* away. The crows are worse



hole, many feet into the air, straight, lurid, setting the woodlands around and the skies above, fairly aglow with ruddy splendor. All night long, a merry group of young people dance, sing and romp around this volcano-like oven. Wood, whenever needed, is piled in until late next morning. At last the embers have burned low, and smoke has ceased to rise from their glaring red depths. Corn stalks, green and plentiful are thrown in, more are tucked into the large draught-hole, and preparations are made for artificially ripening that which nature has procrastinated over. A beautiful, long, fresh stalk is chosen, leaves, tassels and roots complete. Two fine ears of corn are stripped of their husks. One of them is laid against the stalk, the other cleansed of its silk as though for boiling. The chief of ceremonials bites off from this all the milky kernels mouthful by mouthful, chews them to pulp, and blows their substance into fine mist over the heaps of plucked corn. He then places the cob by the side of the other ear, and binds both firmly to the stalk. This, in the brief prayer he presently makes, is called the *shī'-wa-ni* or priest. It is cast into the still glowing pit, and then, men, women, young and old, begin to hurl in the unhusked corn from all sides until no more is left. Most likely space remains at the top. If so, it is quickly filled with green stalks, more of which are bundled up and used as a cork for the circular opening. A mound of damp soil is heaped to a considerable height above this impromptu stopper. As night again comes on, camp-

than they were last spring. The coyotes are not outdone by the crows at either time, but the *burros* are worse than both together. They are, to quote Zuni *Mi'-wi-hā* or "adopted of corn." You may put them in the corrals, tie their fore-feet close together, or herd them as you will, but some of them will "leave tracks and love corn in every field." The remedies are many and ingenious, but all more or less fatally short of happy results. Each man in Zuni knows every other man, and equally as well, he knows every other man's *burros*. If a *burro* be found in a cornfield some morning, the field owner counts the exact number of missing or injured ears, and drives the *burro* home. Forthwith he seeks out the animal's owner. If the latter prove obdurate, the sufferer informs the chief and bides his time. Woe to that *burro* if he get into the cornfield again. He may consider himself fortunate if he lose but one or even both ears. Sometimes he is gagged with a big stick, a cord being passed from either end of the stick up over the shoulders and back, and under the tail, (see initial). The *burro* is then welcome to remain in the cornfield as long as he chooses. At other times, the luckless animal is thrown and a few of his teeth pulled Zuni-fashion; which is to say, a thread of sinew is looped to each, a heavy stone tied to the sinew, and hurled into the air. I remember a lawsuit of three nights' duration over one of these animals. Ever after he was called the "short-horn," and little wonder! For his ears had been shaved close to his head, his

tail cut off short, the tip of his tongue and part of his teeth amputated, his left eye put out, and his back so stiffened by castigation that a five-foot straight-edge laid lengthwise along the very acute angle of his vertebra, would have touched at every point. Two years I knew that *burro* personally. His working days were over. He used to get deplorably hungry, and I sometimes fed him; for, winter or summer, he dared not stir from the protecting although inhospitable shadows of the walls of Zúñi. He preferred picking cedar bark from the fire-wood, anything he preferred, to going abroad. In fact, had he been able to run he would certainly have done so at the sight of a field of corn.

In pity both for crows and *burros*, I have sometimes pleaded mitigation of the customary severe measures. My experiences at such times lead me to advise all aspiring ethnologists to mind their own business when corn is in the question. As I have said before, the Zúñis, and probably most other Indians, are touchy on the subject of their breadstuff.

Frost comes, changing the green of the stalks to yellow gold, the leaf-like shucks to feathers. In every field are corn pickers and huskers. Such corn as is not husked in the field, is packed with consummate method on *burros* or in carts and a few second-hand wagons, and brought to the town. Husking bees are formed by the women, and at three o'clock any afternoon you can see around a corner, mountains of cast-away shucks, and many a black, frouzzly head sticking up from their flaky slopes, bobbing bodilessly with the severance of every ear from its rattling wrappings. At such times husks in great numbers are selected, bundled into neat bunches and strung several feet long on threads of yucca fiber. They will be needed before the month is gone, particularly in the council chambers, where every night brings the weary law-givers of Zúñi fresh cases of trespass for consideration.

How the roofs groan under the weight of drying ing corn; how the walls gleam and glory with the festoons of chili or red pepper! But in time the corn is dry, the peppers ripened enough for storage, and the work of "corn-sorting" begins. The different colors, yellow, blue, red, white, speckled and black are separated. The "nubbin-ears" are put in a cellar by themselves for sale or for *burros*, and as described before, the corn is corded up in the granary around the tutelar divinities of the place—the "Father and Mother of corn crops."

Patient reader, forgive me for having lingered so long in Zúñi cornfields. However closely we may have scrutinized these crops growing green, golden grown as they may have been, we have but barely glanced at them according to the rules and practices of their dusky owners. In illustration of his watchfulness—quite as well as in memory of a forme-

promise—I repeat below a song of the growth of corn plants. Let me begin, however, by saying that I shall give only in the first verse the prelude and refrain which opens and closes each stanza of the song.

I.

"A-he-e'-iu, a-he-e'-iu!
A-he-e'-iu, a-he-e'-iu!
Sa-ni-hi'-akia tchu etai'-e
Te-tchi-nai-u-le, te-tchi-nai-iu-le'e'e."

"Soil shorn and spread by storms!
Soil shorn and spread by storms!
Band of Hunters, their corn grains planted
There may now be seen, there may now be seen."

II.

Sa-ni-hi'-akia, ke'-mu-toi'-ye,—
Band of hunters, their corn grains sprouted.

III.

Sa-ni-hi'-akia, thla-kwi-moi'-ye,—
Band of hunters, their corn grains rooted.

XI.

Sa-ni-hi'-akia, sho-ho-nai'-ye,—
Band of hunters, their corn ears silkened.

XII.

Sa-ni-hi'-akia, o-sho-nai'-ye,—
Band of hunters, their corn plants sooted.

XIII.

Sa-ni-hi'-akia, thla-shi-nai'-ye,—
Band of hunters, their corn grown aged.

This song, although beautiful in the original language and music (possessed as it is of perfect metre, fair rhythm and considerable poetic sentiment) defies exact translation. Not only is it framed in archaic syllables, but the terms in Zúñi for every phenomenon connected with corn and its growth, are so numerous and technical that it is as difficult to render them into English as it would be to translate into Zúñi the terminology of an exact science. I have, however, introduced this approximation as illustrative not only of Indian powers of observa-

tion, but also as giving a fair example of the terms wherewith from planting time to harvesting time may be designated any given period; for the Zúñi, simply adding to any of the above expressions a syllable expressive of time, thus divides the quarters of the "Nameless Months."

A Golden Grist.

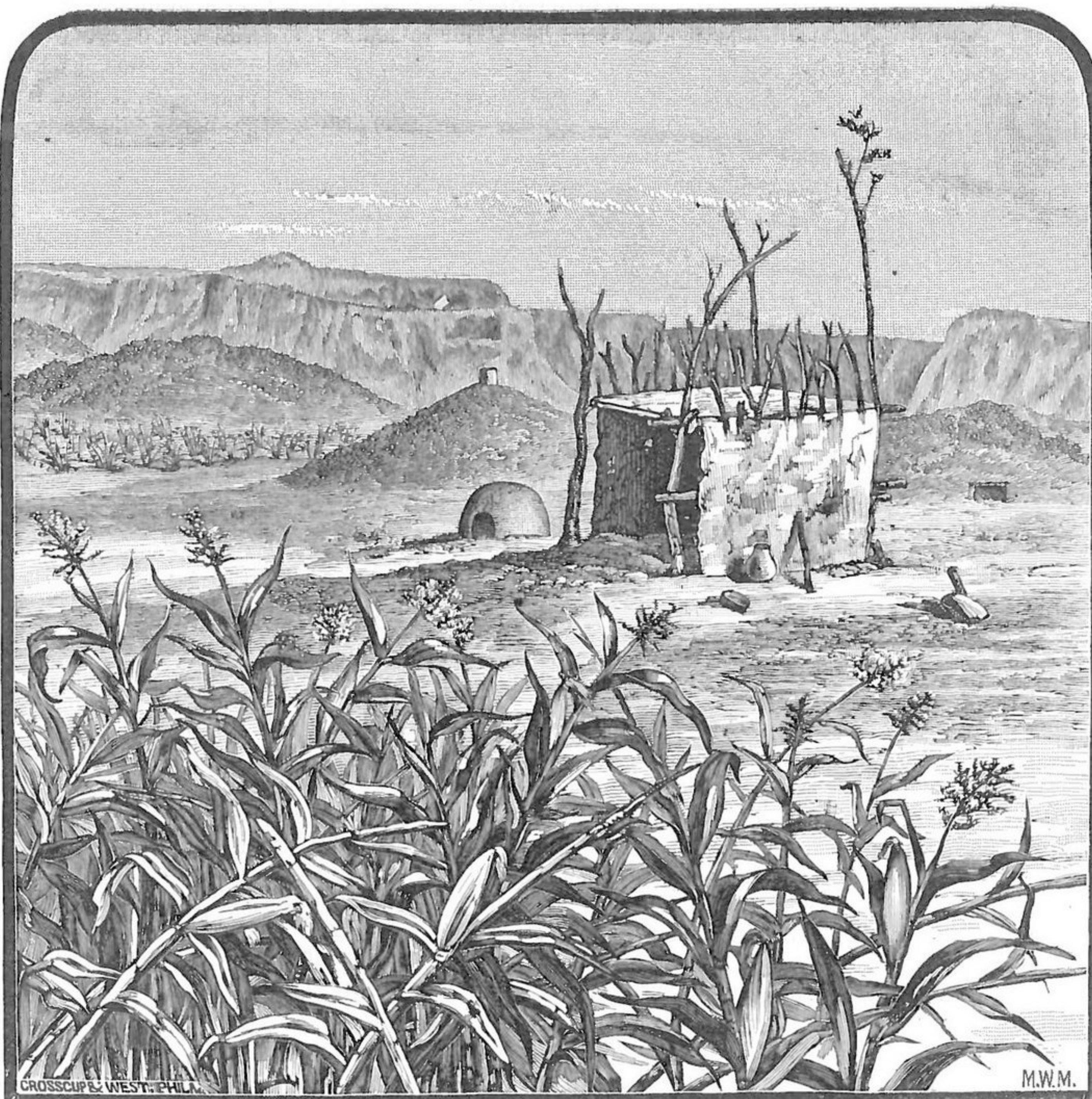
In Swansea, Wales, during a recent bank scare, an old woman drew \$450 from the savings bank and hid it in a sack. Not long after the sack became filled with wheat and was taken to the mill. Then she remembered that the gold was at the bottom of it, and rushed frantically after it, reaching the mill only in time to hear the miller profanely wondering what ailed the wheat that it clogged the stones so. The machinery was stopped and all the gold recovered, though in a much battered state.

Be Careful How You Do It.

Housekeepers are frequently annoyed by oil

marks on papered walls against which thoughtless persons have laid their heads. These unsightly spots may be removed, says an exchange, by making a paste of cold water and pipe clay or fuller's earth, and laying it on the surface without rubbing it on, else the pattern of the paper will then likely be injured. Leave the paste on all night. In the morning it can be brushed off and the spot will have disappeared, but a renewal of the operation may be necessary if the oil mark is old. The experiment will be likely to result most satisfactorily on plain papers, or that with the least number of colored figures.

In the middle of the main street of Aberdeen, Miss., are artesian wells several squares apart which supply the city with water. Every well is covered by a large pagoda, and the ground beneath is paved. The water runs from spouts into troughs and passes off under ground.



IV.

Sa-ni-hi'-akia, k'e'-tsithl-poi'-ye,—
Band of hunters, their corn leaves fluted.

V.

Sa-ni-hi'-akia, la she yai'-ye,—
Band of hunters, their corn leaves feathered.

VI.

Sa-ni-hi'-akia, ta-a-nai'-ye,—
Band of hunters, their corn stalks tasseled.

VII.

Sa-ni-hi'-akia, u-te-ai'-ye.—
Band of hunters, their corn plants blooming.

VIII.

Sa-ni-hi'-akia, te-k'u-ai'-ye,—
Band of hunters, their corn ears started.—[i. e. unfolded within the leaves.]

IX.

Sa-ni-hi'-akia, thla-k'u-nai'-ye, etc.,
Band of hunters, their corn ears shooting. [i. e. starting forth from the leaves.]

X.

Sa-ni-hi'-akia, mi-i-ai'-ye,—
Band of hunters, their corn ears kernalled.

[For The Millstone.]

AUSTRALIAN AND INDIAN WHEAT.

C. KIRCHHOFF.

THE future of wheat supplies from Australia and India continues to be one of the favorite topics of discussion in Great Britain and her colonies. Numerous items of interest may be gathered from the daily and trade papers of those countries having a direct bearing on American agricultural interests likewise so far as this staple is concerned. The following is from the *Melbourne Australasian Trade Review* of April 9:

"The many letters published recently on the subject of Indian wheat growing have, it appears, excited attention in America, even to the extent of the Wall street speculators in American railway securities taking into consideration the possible prejudice that may result from a loss of carrying trade. That the assertions respecting railway extension in India are substantially grounded may be seen from a paragraph, 'Railways in India,' which appears in our present issue. From this paragraph it will be seen that the Indian government is urged to devote no less a sum than £2,500,000 annually to railway construction. We do not wish to be alarmists, and are well aware that the grain markets of the world cannot be permanently supplied and controlled from one source of supply, but we think the question of Indian competition will soon be sufficiently serious to lead either to the abandonment of wheat growing in Victoria for export or to the complete relief of farmers from the inequitable burden of protective taxation which oppresses them. In the latter case they may be enabled to submit to the low range of prices which the Indian wheat crop will inevitably occasion."

Victoria is the only colony in Australia clinging so far to a high tariff to protect its infant manufactures. This high tariff enhances the cost of living to such an extent that the farmer cannot grow wheat cheap enough to compete with other Australian and Indian wheat in the world's markets. The remaining Australian colonies are ready for a confederacy of which Victoria would be a member, but the protective tariff of the latter is the only obstacle in the way.

From Sydney the mail advices *via* San Francisco, dated April 24, are to the following effect: "The official returns of the harvest in South Australia show that the yield was somewhat less than the estimate. The average return was eight bushels per acre. The Victoria agricultural statistics are more favorable than the estimates. The yield of wheat was 15,489,143 bushels, being an increase of 6,747,689 bushels over the previous crop. The yield of barley was 1,060,166, and of oats 4,735,289 bushels, an increase in each case. The wheat averaged 14.09 bushels per acre, against 9.03 in 1883."

Since then a cable dispatch *via* London says it is expected that the total export of wheat from South Australia alone will be 11,000,000 bushels. The rainfall throughout the country has been good.

At any rate a country capable of increasing its wheat production in a single year as is shown above is not a contemptible competitor, although by far not as formidable as India. English economic writers indeed consider it absolutely certain that the time is coming when the greater part of the English grain trade will be diverted from the United States to their Indian empire. If there is any truth in this it is a far more serious matter than it may appear at the first glance. Ten years ago our exports in breadstuffs consisted largely in grain, and at that time Russia was our only competitor of note. Within the decade we have made wonderful progress in our milling methods and systems, and now even Paris and Vienna seek our patent spring wheat flour. The bakers of those cities consider it as good as the flour made at their own mills, and the demand for American-made flour has increased tenfold. In the markets of Great Britain and Ireland our flour is a competitor with the Hungarian, while the English-made flour is only regarded as second-

class, none of it reaching the price of that made from our spring wheat, and even our winter "patent" and "fancy" bring a higher price than the English flour, whether manufactured from native wheat or the same kind as that from which the American-made flour is manufactured. This has caused a rivalry to spring up between the two countries in flour manufacture which has in a certain sense, so far as manufacture goes, benefited both. The English millers, however, are beginning to complain about not being able to get our best wheat, and consequently have to seek for a quality as good in some other market. Their attention has been recently directed to their own colonies, and India was found to be the best and cheapest wheat-producing section.

Eleven years ago India sent to Great Britain about 600,000 bushels of wheat annually. This has been increased to 44,000,000 in 1883, or nearly half of the British imports. In France, Italy and Belgium this wheat has taken high rank, and bids fair to outbid Russia in all her markets, and to make very close competition with the United States.

The total requirements of Europe in the coming harvest are at the present time estimated not to exceed 218,000,000 bushels. Russia is expected to furnish 56,000,000 bushels against 44,000,000 from India, while the supply from America will probably be about 92,000,000, or a trifle more than double the supply from India. With the large expansion of British enterprise in India it may confidently be predicted that at no distant day the exports of Indian wheat will be second only to those of the United States, and the pressure of competition will be severe and long on all who enter the wheat market. India will sow better seed, use better tools, and before long have better means of inland transit, and the American elevator with which to handle her grain.

Both English and French houses are making a very light system of railway of from 24 to 30 inches gauge, which is very much used in countries south of the equator. This system can be laid down at a cost of from \$1,000 to \$1,200 a mile. Much of it has been in use in Queensland on the sugar plantations, and it has also been introduced into India by private enterprise, so that the outlook for wheat growers on this side of the Atlantic, in the face of all these improvements, is, to say the least, not inviting. Today Indian wheat is an important factor in European grain markets, and if not at present a formidable rival, it has been a check against high prices brought about by speculators through artificial means, so that the American grain grower will have to reduce the cost of production and be content with small profits.

Fortunately in a country like this and with a nation like ours there is not a branch of agriculture, cattle raising or metallurgy, however small, which has not fostered along and apace with it an industry to subserve the same. Frequently the industry overshadows the raw material. Thus, flour production and export have expanded and been perfected in a ratio truly marvelous. India and Russia as well as Australia may become close competitors with their wheat, and even formidable ones taken in a lump, but they cannot turn out flour, either of them as good and as cheap, and the saving in freight across the seas on flour as compared with wheat may safely be put down at 20 per cent. at least. It therefore remains for the millers to take the matter in hand and send a quality of flour to Europe that it will be next to impossible to compete with. We will then have the advantage of production and manufacture, with the residuum left for cattle food.

About a year ago the McDougall Brothers, chemists, were employed by the English government to make a comparative test of Indian wheat with oth-

er wheats. Equal quantities were taken of American, Indian, Austrian, Russian and Egyptian grain they were ground into flour, and the flour was made into bread, and an accurate account kept of the results. The weight of each bushel of the Indian wheat was found to be greater than that of any of the others, and the yield of flour was larger because the bran was much thinner. The percentage gluten, which is the main element of nutrition in bread, is much larger in our wheat, but when the flours were made into bread the percentages were again in favor of the Indian wheat,* which goes to show that their flour is drier than ours; but in describing the color, taste and general characteristic of the bread the preference was given to the American article. Hence it seems reasonable to infer that Indian wheat will be used principally for the purpose of mixing with American and European wheats.

Our aim should be to send our surplus in flour and not in grain. If we do that no country can compete with us. As we have shown in former statistical articles this has been the tendency for several years past, so that so to say by instinct we have gradually adopted the correct policy in this wheat competition question, and, as we proceed, it will more and more obtain an overshadowing importance.

*[The McDougall tests were subsequently disproved by the experiments of one of the leading bakers of Great Britain, who made his experiments under private contract going over the identical tests of the McDougalls. The former proved nothing not favorable to the British wheat dealer, miller and baker, and they were so meant to be made, if an intelligent reading of the McDougall Bros.' report prove anything.—ED. MILLSTONE.]

On the Basis of Experience.

A Brooklyn man who hit wheat for a few thousand dollars last week, rushed around and rented a brown-stone front, and then sought the services of a furniture mover. "I'll take it by the job and do the fair thing by you," replied the mover. "Well how fair?" "I'll say fifty dollars for the two." "What two?" "Why, the moving this week into the brown stone, and the moving, in about a month from that into a cheap frame house in the suburbs. I always job the two moves together in the case of a grain speculator?"—*Detroit Free Press.*

A Dot for Friend Downton.

Mr. Richard A. Proctor holds that if the full power of the arms and legs can be so applied to ingeniously arranged mechanism as to work wing more or less resembling those of a bird, there is little reason of doubting a man's power of sustaining himself in the air and even traveling with great rapidity through it. Probably, he adds, it will be much easier for him to sustain himself while traveling rapidly onward than while hovering over the same spot.

A Wild Scheme.

A scientific expert proposes to turn the Colorado river into the Arizona desert, creating an immense lake, and by utilizing it for irrigation purposes convert a vast area into productive farming lands. It is claimed that the evaporation from the large body of water will greatly modify the hot winds and heats which largely create the drouths which assail Kansas, Nebraska and Dakota.

Indeed It Does.

It takes a saw mill man to successfully run a saw mill.—*Northwestern Lumberman.*

And it takes a miller to successfully run a flour mill. The force of this axiom lies in the fact of its simple statement.

About three o'clock in the morning of the 4th inst., the Bruce flouring mill, at Winamac, Ind. belonging to John Hayworth, was burned. Loss: \$6,000, insurance \$2,500. There is a general belief that it was the work of an incendiary.

AN IMPOSING MILL.

IN March, 1884, the following item appeared in THE MILLSTONE: "Passengers on the Chicago & Alton and Wabash railroads going west may have noticed at Louisiana, Mo., just at the west end of the bridge over the Mississippi river a substantial four-story building. This will contain the machinery for a two-hundred barrel roller mill, for the Excelsior Milling Co., of that place. The machinery is being made and set up by Nordyke & Marmon Co., of Indianapolis, Ind."

Our artist has produced an admirable view of the building as shown herewith. The foundation is of roughly dressed stone, and the walls 17 inches thick, of hard pressed brick. The girders, joists, posts and under side of the floors are dressed and nicely painted, and brick walls whitewashed. The engine room is in two compartments, one of which contains a battery of boilers, with handsome fire-front and steam fixtures; the other an automatic engine of 75 horse power. The coal is received direct from cars into bins adjoining boilers.

The first floor contains 18 pairs of rolls, six pairs of which reduce the wheat to middlings, while the remainder are for reducing the middlings to flour and finishing up tailings.

The cleaning machinery is full and complete, consisting of separator, scourer, smutter and brush finisher. There are seven large purifiers, which clean the middlings, while the bolting is done on 10 scalp-ers, 12 flouring reels, two centrifugals and one grader for middlings. There are also seven dust collectors, two bran dusters and two flour packers, which, together with the 24 elevators and necessary shafting, pulleys, belting and gearing complete the list of machinery. The total cost of this mill approximates \$35,000, including building.

The machinery is arranged in a novel and simple manner, which admits of large passage-ways between each machine.

The owners are business men of large experience and observation, and were therefore good judges of machinery, and this is the reason why the contract was awarded to the above named firm. All parties interested, or those proposing the erection of a similar mill, are cordially invited to inspect this mill, where each visitor will receive courteous attention.

Centrifugal Cheese.

The latest article prepared for human consumption on an economical plan is described as "centrifugal cheese." The beauty of the method of manufacture is said to be that the centrifugal movement of the apparatus employed throws out every particle of cream from the milk and leaves the watery remnant to do duty as cheese. People say that a great deal of this stuff is made in the West.

Texas produces half the cotton raised in the United States.

Physiology in Brief.

The average number of teeth is 32.

The average weight of an adult is 140 pounds 6 ounces.

The weight of the circulating blood is 28 pounds.

The brain of a man exceeds twice that of any other animal.

A man annually contributes to vegetation 124 pounds of carbon.

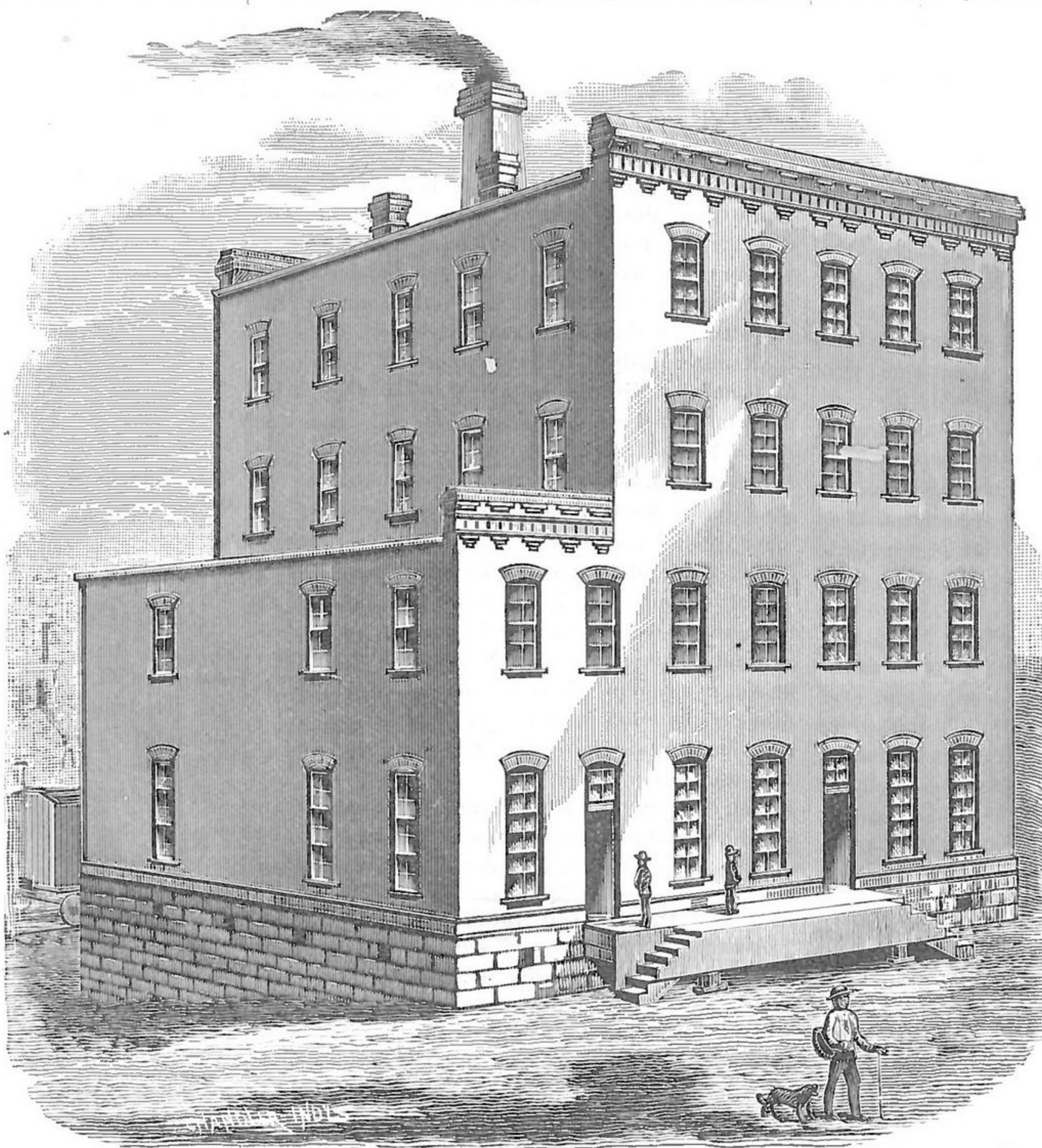
One thousand ounces of blood pass through the kidneys in one hour.

A man breathes about 20 times a minute, or 1,200 times in an hour.

The average weight of a skeleton is 14 pounds. Number of bones 240.

The average weight of the brain of a man is three and one-half pounds; of a woman, two pounds and eleven ounces.

Five hundred and forty pounds, or one hogshead



and one and one-quarter pints of blood pass through the heart in an hour.

A man breathes about 18 pints of air in a minute, or upward of seven hogsheads a day.

Twelve thousand pounds, or 24 hogsheads 4 gallons, or 10,728½ pints pass through the heart in 24 hours.

The average height of an Englishman is 5 feet 9 inches; of a Frenchman, 5 feet 4 inches; of a Belgian, 5 feet 6¾ inches.

The average of the pulse in infancy is 120 per minute; in manhood, 80; at 60 years, 60. The pulse of females is more frequent than that of males.

One hundred and seventy-five million holes or cells are in the lungs, which would cover a surface 30 times greater than the human body.

The heart sends nearly 10 pounds of blood through the veins and arteries each beat, and makes four beats while we breathe once.—Exchange.



In a Chinese city when a man goes out after dark he carries a paper lantern with his name and address upon it.

A French writer regards the familiar yet mysterious phenomenon known as the zodiacal light as simply a reflection of light from the illuminated part of the earth upon an upper stratum of the atmosphere.

Statisticians say that the smallest annual rainfall in this country is in New Mexico and California, 13 and 18 inches respectively, and the highest in Oregon and Alabama, 40 and 56 inches.

In the island of San Domingo there is a remarkable salt mountain, a mass of crystalline salt nearly four miles long, estimated to contain 89,337,600 tons, and said to be so clear that type can be read through a block a foot thick.

Fortress Monroe, Va., is the largest fort in the world, covering an area of 70 acres. It was built in 1817, and to the uninitiated looks almost impregnable. In shape the fort is an irregular hexagon, two sides fronting the water, while the other four command the land approaches.

A flower has been discovered in South America which, it is stated, is only visible when the wind is blowing. The shrub belongs to the cactus family, and is about three feet high, with a crook at the top, giving it the appearance of a black hickory cane. When the wind blows a number of beautiful flowers protrude from little lumps on the stalk.

The finest rubies are found in Ava, Siam and Peru; others are found in Ceylon, India, Australia, Borneo and Sumatra. The Burmese mines have long been famous; the working of them has been a royal monopoly, and the King has among other titles that of Lord of the Rubies. The Brazilian ruby is declared to be a pink topaz, inferior to the true ruby, yellow in its natural state, and colored artificially.

The number of seals along the coast of Newfoundland is rapidly increasing. Those found in that locality are chiefly valued for their skin and oil, the skin being used for leather. In Greenland the flesh is eaten. After the seal is shot the skinner removes the fat. An expert can remove the fat from 500 seals in ten hours. He is careful not to cut the skin, for every hole he makes in the skin deducts ten cents from his pay.

[For The Millstone.]

NEW OUTLETS FOR SURPLUS MANUFACTURES.

HENRY HANNAFORD.

SINCE all the civilized nations in the temperate zone have largely gone into manufacturing, and since by the aid of steam and perfected machinery and processes, there are turned out more goods than the countries themselves can possibly consume, the necessity has been felt for a better outlet in all quarters and in this manner great impulse has been given to the export trade; there has been indeed a general scramble, dating from 1873, in this direction from Europe, and increased activity from this country since the Centennial.

The results have been on the whole all that could be wished for; a good deal of business was, as may be supposed, taken away from the English, but even the latter have seen their export trade increase on the whole, notably, to India and the remaining colonies. Americans have been very successful, our export tables showing a notable increase as was shown in May MILLSTONE. Our goods have acquired everywhere a well deserved popularity on account of their good quality and their neatly got up exterior. We have even made two reciprocity treaties, one complete with the Sandwich Islands, and one partial with Mexico. Into the latter country we have secured access, duty free, for no less than 74 articles of merchandise on which the duty ranged between 19 and 86c. (Mexican silver coin), the kilogram, consequently was downright prohibitive. At the same time, since a month or two, there is railroad connection all the way from any point in the United States to the City of Mexico, and the competition between rail and ocean steamers in the Mexican trade we are carrying on is such that freights are materially lowered and that on certain articles the freight from Europe weighs so heavily in comparison as to exclude them while our goods take their place.

In certain articles of manufacture, like for instance flour, we have of late years made astonishing headway as exporters, although, of course, even in this item there are fluctuations, yet the annual average of American flour is at present surprisingly great. We shipped during the first nine months of the fiscal year ending June 30, 6,836,721 barrels, against 7,293,227, the falling off being to Europe, while tropical countries took more of our flour than ever.

People in Europe have been as active as we have in pushing their export trade, with varying success. French manufacturers complain that they have been losing ground abroad and that English, American and German competition has ousted them from a number of markets. They produce figures to show it. We believe that this decline of French exportation is due chiefly to the heavy taxation necessary to square the budget, but enhancing the cost of living and also the cost of manufactures for the export trade. At any rate the French Government did not leave these complaints unheeded, it even went the length of picking a quarrel with Tunis, Annam and China on account of Tonquin, and Madagascar; it sent expeditions to those countries and obtained complete success in two of them, now being engaged in the third, all for the sake of opening new fields for the sale of French goods and the profitable employment of French capital.

The English undertook armed interference in Egypt and in its dependency, the Soudan, for no other than commercial, financial and transit interests in connection with the canal route to India. Quite recently in a slight way England made the Congo treaty with Portugal which has raised such a cry on all hands that the Portuguese Chamber has adjourned without ratifying it, because even in

Portugal it meets with opposition. The Australian colonies are making strenuous efforts for a political and economical union merely because they know and feel that they will then be at liberty and powerful enough to annex New Guinea. In North Borneo the British have gained an important foothold under cover of a chartered trading company, acquiring valuable plantation and mining lands.

Even the Germans who never possessed a colony beyond the seas, have gone into the same business, with a will we are assured, and the old Emperor declares that his son's and successor's task will be to raise Germany's influence in remote countries through colonization to a degree of eminence only second to its fame on the field of battle, and by way of tentative settlement 300 square miles of land supposed to be rich in copper mines are while we write being taken possession of in the name of the German Empire in Great Namaqua land, 180 miles north of the Orange river in Southwest Africa, in close proximity to the Cape Colony. This new colony was purchased by a German firm on April 29, 1882, for \$1,000 and two field pieces from the Hottentot King Joseph, of Bethany, whose father had acquired the land for a pick-ax. But greater things in colonial history have had an origin as modest, and the acquisition may prove valuable in the long run, the tendency being very strong that way in Germany where the public mind is determined to found something not contemptible in the way of national trans-oceanic settlement.

Simultaneously a "trans-oceanic bank" is founded at Hamburg with a capital of 20,000,000 marks, to be increased eventually to 60,000,000 marks, in which leading Hamburg commercial firms and leading Berlin bankers take a personal and pecuniary interest, the bank being established on a strictly non-speculative basis, merely to facilitate merchandise credits and direct valuation in Germany.

Civilization and trade can only be gained by all the activity we thus notice in leading commercial and industrial nations. If the new German colony of Angra Pequena we have just alluded to, should prove to be what it is thought it really is, viz, a great copper producing country, this would be an important item added to the world's wealth in a barren country hitherto overrun by Hottentots and Bushmen and not many years ago considered to be worth no more than a pick-ax by a native chieftan.

Perforated Sheet Metal.

Aitchison & Co., of Chicago, for a number of years located at 292 State street, having outgrown their quarters have removed to larger rooms on the ground floor at 76 Van Buren street, where they will have ample facilities to manufacture their extensive line of goods and attend more promptly to filling of orders.

"Virtue Hath Its Own Reward."

Nearly 2,000 feet of 12-inch Caldwell conveyor has been put in a grain house at St. Louis, Mo., by the Todds & Stanley Mill Furnishing Co. This conveyor was put in to supply the place of drag chain which was taken out. "Merit wins," so says H. W. Caldwell, 46 South Canal street, Chicago.

New Corporation.

The National Link Belting Company, of Terre Haute, Ind., was incorporated on the 17th inst. The capital stock is \$50,000, and the directors are Joseph Collett, R. G. Harvey and Crawford Fairbanks.

The wife is called the better half, but in the base ball season, the husband bets for the whole family.—*Oil City Derrick.*

The flouring mills at Mount Leonard, Mo., burned on the 19th inst. Loss, \$26,000; insurance, \$11,000.

INDIANA GRAIN DEALERS.

ABOUT 150 dealers in grain in this state held a meeting in this city on the 12th inst., to consider the abuses existing in the grain trade and to organize a permanent association for mutual protection.

The reforms it is thought such an association can at least in a measure bring about may in brief be stated: 1. The practice of false inspection and undergrading of grain by elevator men and boards of trade. 2. The abuse by farmers of the privilege heretofore enjoyed of borrowing grain sacks and neglecting to return them. 3. To stop the growing habit of farmers in sending uncleaned wheat to market. 4. To encourage the raising of the better qualities of wheat.

The unanimous opinion seemed to be that under grading and false inspection was the greatest evil the trade has to deal with. It was undermining the entire foreign trade. The value of a bushel of wheat was varied from two to ten cents, according to its weight, but the proper rules for inspection were in so many cases evaded that the difference is ignored, and the poorest wheat that would grade No. 2 determined the price of the whole grade. If a farmer were to offer a miller wheat weighing less than 60 pounds, the miller would refuse to buy it as No. 2, but a dealer who is buying for re-shipment would pay the current price, knowing it would grade as No. 2 in Toledo, New York or else where. Foreigners have submitted, because they were compelled to, but now they are in a large measure independent of our supplies, and it is necessary that wheat should grade at its actual value and become in value what its grade represents it to be, and not, as is often the case, something entirely different.

A permanent organization was effected by the election of Mr. Dunlap, of Franklin, president; Mr. Wilkinson, of Knightstown, vice-president; Mr. Richardson, of Indianapolis, treasurer, and Mr. Higgins of Indianapolis, secretary. A board of managers was appointed consisting of John Harrison, of Hendricks county; W. H. Croucher, of Miami; R. F. Crabbs, of Montgomery; William Pratt, of Hancock, and James Sweetzer, of Grant.

Grain-dealers and millers were made available to membership, and articles of association adopted.

The committee on weights and grades reported as follows: Wheat weighing 60 pounds to the bushel, or by the grain tester, shall be considered standard. When wheat falls below this standard buyers are requested to make the following discounts in price, which will make it equivalent, to-wit:

Wheat weighing 60 pounds.....	1c per bushel off.
Wheat weighing 58 pounds.....	3c per bushel off.
Wheat weighing 57 pounds.....	6c per bushel off.
Wheat weighing 56 pounds.....	10c per bushel off.

And wheat falling below 26 pounds to be taken at the discretion of the buyer, and with damaged wheat to use their judgment, with the advice to buy at a low figure with a view to discouraging careless farming.

The report was adopted, as was also the one on the grain sack nuisance, which read as follows:

"Whereas, It seems impossible to unite all the grain dealers in the matter of loaning grain sacks to farmers, and, as the practice is pernicious to the interests of the grain trade, the committee recommends each county or each organized locality to abolish the practice, and that every member of the association pledge himself to use all honorable means to bring about a total abandonment of the practice at the earliest times."

A good deal of miscellaneous discussion ensued, and it was ordered that another meeting be called for the first Tuesday in July, in this city, by which date something could be determined from the known quantity and condition of the crops, which would begin to move about that time, after which the meeting adjourned.

The association has since been incorporated under the laws of the state.



THE HUNGARIAN TRADE.

THE meeting of the stockholders of the combined Budapest mills was recently held. The reports presented at this meeting of the business done in 1883 were very generally favorable, the mills having been able to declare good dividends.

The following tables are compiled from these reports, presenting their subject matter in a form favorable for comparison. We are thus enabled to see the wide differences in the manner in which the Budapest mills are operated, and can form some idea of the corresponding differences that must exist among the provincial mills.

During the year 1883 there were ground of wheat in the

Louisa Mill.....	355,782	centners.*
x Concordia Mill.....	650,000	"
x Victoria Mill.....	420,000	"
x Pannonia Mill.....	800,000	"
Elizabeth Mill (Pest).....	369,179	"
Roller Mill.....	635,000	"
Millers and Bakers' Mill.....	485,910	"
x Ofen-Pester Mill.....	915,000	"
x United Mill.....	580,000	"
xx Gisella Mill.....	766,000	"
xx Haggenmacher's Mill.....	695,000	"

6,671,871 "

The mills marked x do not report the amount ground during 1883, and the amounts given are estimated but are approximately correct. The mills marked xx are the property of individuals and from them no reports were made and no figures given. The figures given for these mills are all estimated upon their known daily production. Since there are no reports for these private mills they are not included in the following tables.

	Persons employed.	Cost in Gulden by wear and use of machinery.	Money in gulden.
Louisa	167	41,003.17	308,750.8
Concordia	363	100,000.	759,373.83
Victoria	219	50,972.	307,696.57
Pannonia	322	47,239.13	516,075.40
Elizabeth	176	33,588.17	339,494.70
Walzmühle	444	55,225.49	546,325.33
Millers and Bakers'	288	60,000.	371,975.45
Ofen-Pester	474	47,121.28	598,731.86
United Steam Mill.....	285	52,418.83	408,760.49
	2738	437,586.07	4,157,184.21

Besides this the Haggenmacher mill has 282 employes and the Gisella mill has 198 employes.

If these figures are compared with those of the first table we get the following interesting items: A centner of products costs in labor and machinery in the

	Persons employed.	Machine wear and use in gulden.	Money in Gulden.
Louisa .....	.00047	.115	0.868
Concordia .....	.00056	.154	1.168
Victoria .....	.00052	.121	0.733
Pannonia .....	.00040	.059	0.645
Elizabeth .....	.00048	.091	0.919
Roller Mill .....	.00070	.087	0.860
Millers and Bakers' .....	.00059	.123	0.765
Ofen Pester .....	.00052	.051	0.654
United Steam Mill.....	.00049	.090	0.705
	.00053	.094	0.797

For the first column we have for the Haggenmacher mill .00041, and for the Gisella mill, .00026. This gives an average of .00048 of a person to each centner of product. As regards the labor employed

the Elizabeth mill is just the average; three mills go below the average, while seven exceed it.

The Gisella mill has the highest per cent. for labor, since a centner of products requires .00026 of a person, while in the Millers' and Bakers' steam mill it is .00059. The depreciation of machinery is greatest in the Concordia mill and the least in the Ofen-Pester mill; four mills run below the average, while five exceed it.

It would be a mistake to place too great value to the figures attached to the machinery column since each mill estimates its machinery at a less valuation each year, and such valuation is arbitrary. In profitable years the wear and tear of machinery is greater than in bad years. This is also an arbitrary estimate, nevertheless these estimates must enter into the cost of production.

The cost of manufacture is greatest in the Concordia and least in the Pannonia mill. Five mills fall below the average and four exceed it.

In order to give the preceding tables their highest value the following is compiled:

a. How many centners of product each person averages in each mill?

b. How many centners of product are output in each mill per annum for each gulden of wear and use of machinery?

c. How many centners of product each mill turns out for each gulden of outlay?

	a.	b.	c.
Louisa	2130.4	8.68	1.15
Concordia	1790.6	6.50	0.86
Victoria	1917.8	3.24	1.36
Pannonia	2484.5	16.93	1.55
Elizabeth	2097.6	10.99	1.09
Roller Mill	1430.2	11.50	1.12
Millers and Bakers'	1787.2	8.10	1.31
Ofen-Pester	1930.4	19.41	1.53
United Steam Mill.....	2035.1	11.06	1.42

The remarks made upon the preceding table apply here: For the Haggenmacher mill a 2464.5 and for the Gisella mill 3868.7, while the general average is 2073.2.

In conclusion we will consider the relation of cap-employed a, the reserve fund b, the profits c, and the dividends d paid to the stockholders:

	In gulden	In gulden	In gulden.	In gulden.
Louisa	500,000	258,726	163,256=29%	112,000=10%
Concordia	1,150,000	100,000	143,509=12	115,000=10
Victoria	720,000	250,000	116,036=16	96,000=10
Pannonia	1,220,000	280,238	173,006=13	122,000=13
Elizabeth	900,000	200,000	134,563=15	90,000=10
Roller Mill	1,000,000	148,534	85,783=85	80,000=8
Millers and B	900,000	370,204	225,739=25	180,000=20
Ofen Pester	1,000,000	601,349	347,793=35	240,000=24
United Mill	1,021,176	.....	150,775=15	.....

MOLNAR.

BUDAPEST, May 20, 1884.

A High Indorsement.

To the Editor of The Millstone.

SIR: I entirely agree with the views you have expressed as to the relative merits of the different kinds of rolls used for the reduction of middlings, germ, etc., viz.: that in point of severity the millstone stands first, scratch rolls second, porcelain rolls third and smooth iron rolls last, and for that reason their relative merits are in reverse order to their severity. The object sought is to reduce the pure portions to the necessary degree of fineness with the least possible reduction of impure portions. The tool that will thus accomplish the reductions is in my opinion the best tool to use.

Respectfully yours, HOMER BALDWIN.

YOUNGSTOWN, O., May 26, 1884.

Walter's Wisdom.

To the Editor of The Millstone.

SIR: I find that THE MILLSTONE ad. is a good thing, and will run it a year on your terms, and inclose herewith my check for — for six months ad. as agreed. Yours, etc., J. T. WALTER.

EASTON, Pa., June 13, 1884.

THE YOUNG MILLER'S GUIDE.

FROM OLIVER EVANS' BOOK.

To give two stones of different diameters the same draft, we must make their draft circles in direct proportion to their diameters.

The less the draft the deeper the furrow, and the greater the draft the shallower must the furrow be to prevent the meal from escaping unground.

The stone will never be in the best order for cleaning the bran without first grinding a little sand to sharpen all the little edges formed by the pores of the stone.

Some are in the practice of letting stones run for months without being dressed; but I am well convinced that those who dress them well twice a week are well paid for their trouble.

The principle of grinding with stones is partly that of shears clipping. If the shears cross one another too short they cannot cut. This shows that all strokes of the pick should be parallel to the furrows.

The stones must be dressed so that they will not touch at the center within about a sixteenth or twentieth part of an inch, but to get closer gradually, till within about ten or twelve inches from the verge of the stone, proportioned to the diameter, and from that part out they must fit nicely together.

The greater the number of pores in the stone, so as to leave a sufficient quantity of touching surface to reduce the flour to a sufficient degree of fineness, the better, but I may observe that there is no need of any pores in the stone to be larger in diameter than the length of a grain of wheat, for whatever they are larger, is so much loss of the face, because it is the edges that do the grinding; therefore all large pores in stones are a disadvantage.

When stones are first set to grind, they incline to raise, and grind coarser for a considerable time, the true reason of which is difficult to assign. Some attribute it to the expansion of the metal in the spindle; it has been suggested to me, that it is steam, or the rarification of the air, by the heat produced by the action of the stones, which not having a perfectly free passage to escape, bears up a part of the weight of the stone, and this will increase until the stones are heated to the greatest degree.

The reason why a stone that is balanced at rest will sometimes not be balanced in motion, is, that if the upper side be heaviest on one side and the lower side be heaviest on the other side of the center, the heaviest parts draw outwards most by the centrifugal force, which will put the stone out of balance while in motion and if the stone be not round, the parts farthest from the center will have the greatest centrifugal force, because the centrifugal force is as the square of the distance from the center.

I have tried the following experiment: I contrived to catch as much of the dust of flour that was floating about the mill, as made a large loaf of bread, which was raised with the same yeast and baked in the same oven with other loaves that were made out of the most lively meal; when the loaf made of the dust of the flour was equally light, and as good, if not better than any of the others, if being the moistest and pleasantest tasted, though made of flour that felt like oil, it being so very fine. I therefore conclude that it is not the degree of fineness that destroys the life of the flour, but the degree of pressure applied on it in grinding, and that flour may be reduced to the greatest degree of fineness without injuring the quality, provided it be done with sharp clean stones, and little pressure.

The Andes flouring and woolen mills, at Belleville, W. Va., burned on the 18th inst. All the machinery and a large quantity of wool, woolen goods, grain and flour were destroyed. The mill was owned by Wells & Congrove. Loss, \$7,000; no insurance.

*A centner is the measure of a hundredweight.

†A gulden is worth in American money 40.1 cents.

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STEAM CATECHISM—VI.

ROBERT GRIMSHAW.

What is a four-ported engine?

A four-ported engine admits the steam through one port and exhausts it through another at the same end.

What are the objections to a four-ported engine?

A four-ported engine, if it leak after cut-off, will blow clear through into the exhaust. In some four-ported engines the clearance is greater than in some two-ported ones.

Should the steam and exhaust valve receive their motion together or independently?

It is well where there are separate valves for admission and exhaust, that these should receive their motion independently of each other.

What is a good precaution with regard to the throttle?

It is well to have two throttles, one of which will control the steam supply should the other stick open, or leak.

What may be said about balanced slide-valves?

Balanced slide-valves, while lessening the waste of power required to move the valve, are apt to wear, cut and leak after a few months' use, and become inoperative.

What is the advantage of horizontal engines over vertical?

Horizontal engines are generally more accessible than vertical.

What are the disadvantages of the beam engine?

The objections to the beam engine are its complication, size, weight, slow speed and inapplicability to the horizontal type.

What are the advantages of the beam engine?

The beam engine has the merit, for large powers, of being better balanced than a horizontal engine; it has the merit of not wearing out of round in the bore.

What are the advantages of vertical over horizontal engines?

Vertical engines take up less room, require less foundation and wear less out of round in the bore than with horizontal engines.

What are the advantages of "direct-connected engines."

The advantages of direct-connected engines are that the first cost and maintenance of belts, pulleys, gears and shafts, the noise of the gears and the slip of the belts are lessened; and less space is taken up.

What are the advantages of long stroke?

The merits of long stroke are, low speed and friction of the journals and crank-pin, with the same weight of fly-wheel; but as long-stroke engines should have proportionately heavy fly-wheels, this brings in, where the fly-wheel is heavy enough, increased journal friction due to the weight. The longer the stroke the less the proportion of clearance volume.

In building slow speed engines, what is aimed at?

In building slow speed engines, the effort is made to get light reciprocating parts and heavy fly-wheel rim.

In building high speed engines, what is aimed at?

In building high speed early cut-off engines, the effort is made to get heavy reciprocating parts so as to get smooth running; the heavy cross-head absorbing much of the impact of full steam and giving it out after cut-off.

How should the eccentric be fastened to the shaft?

The eccentric should be fastened by a key and not by a set-screw, as the latter is liable to slip or work loose and cause much trouble and perhaps great damage.

*Should the connecting-rod brasses be bored an**exact fit to the crank pin and cross-head pin?*

The connecting-rod brasses may well be bored a trifle large for the pin, so that when brought up snug they may leave loose spaces which will hold and distribute the lubricant.

Which are the best—stud-bolts or through-bolts, for cylinder head and valve-chest cover?

Through-bolts are to be preferred in every case where they can be used.

What conditions tend to cause leaky valves?

Leakage of valves is liable to occur in time, with cylindrical valves; with those having variable travel, and where the valve-closing action is not positive. Poppet valves may leak from unequal expansion.

How should a slide-valve be fitted to its seat?

A slide-valve should be fitted to its seat by filing and scraping them, and not by grinding them with emery and oil.

How should the main journal and its bearing be fitted and kept to a bearing?

By filing and scraping; when necessary, by chipping, but never by using emery.

To insure perfect accuracy in size, shape and finish of the journal and crank-pin, how should they be got up?

To make sure that the crank-pin, journals, etc., are round, straight and perfectly finished, they should be ground on centers.

What is the best kind of packing for the piston-rod and valve-rod?

The piston-rod and valve-rod, if small, may be packed with braids of hemp or of cotton wicking; if large, with rings cut from "coil packing" of hemp, asbestos, etc., and if very large, with rings of anti-friction metal, coned, split and set "breaking joint."

What is the best material for piston packing?

If the piston is spring-packed, or self-packed, either gun metal or cast-iron rings, properly split and "breaking joint" will do.

What should be the maximum steam port area?

The greater the piston speed the greater the steam port area required. For a piston speed of 500 feet per minute, (corresponding to 250 revolutions per minute in engines of 12-inch stroke) the steam port should be $\frac{1}{10}$ the piston area. Thus an engine 9x12, running 250 turns, should have a steam port area of 6.39 square inches; and in the same proportion for higher piston speeds.

What should be the slide area?

The slide area should equal the pressure upon the guides in pounds, divided by 40 to 80.

What should be the length of the connecting rod?

The length of the connecting rod (if of wrought iron) should be 4 to 8 times the crank-length; that is, 2 to 4 times the stroke. Thus if the stroke is two feet the connecting rod should be 4 to 8 feet long.

What should be the piston head thickness?

The piston head thickness should be about the fourth root of the product of the piston diameter and stroke. Thus, for a 20x48 engine it should be $\sqrt[4]{960} = \sqrt{30.98} = \text{nearly } 5.57$ inches.

What is the advantage of having a light piston head?

The advantage of having a light piston head is that in case of a nut or of a great amount of water getting in the cylinder the piston head would be smashed rather than the cylinder head knocked out, which latter would wreck the engine.

What should be the diameter of the piston rod?

The diameter of a wrought-iron piston rod should be 0.0179 the piston diameter, in inches, times the square root of the steam pressure in pounds per square inch. When the stroke and diameter are equal, if this comes less than $\frac{1}{2}$ stroke, make it 0.03901 times the cylinder diameter, times fourth

root of steam pressure. Thus, if we have a 20' 48" with 80 pounds initial pressure, the piston rod if of wrought-iron, should be equal to $20 \times 0.0179 \times \sqrt{80} = 20 \times 0.0179 \times 8.9443 = 3.202$ inches. In 20'x20" it would be $20 \times 0.0179 \times \sqrt{80}$, according to this last rule, which would make it 3.202 inches which being more than $\frac{1}{2}$ stroke will do. In 12'x12", at 80 pounds boiler pressure, this rule would give $12 \times 0.0179 \times \sqrt{80} = 12 \times 0.0179 \times 8.944 = 1.885$ inches. By the second rule it would be $0.03901 \times 20 \times \sqrt[4]{80} = 0.03901 \times 20 \times 2.989 = 2.33$ inches.

What is the proper place for the cross-head pin and why?

The cross-head pin should be in the center of length of the shoes, instead of toward one end as is usual; in which latter case there is a tendency to break or wreck the cylinder.

What adjustment should the guides have?

The guides should have adjustments for wear.

What should be the thickness of the connecting rod?

The thickness of the connecting rod may be—0.0179 cylinder diameter times the square root of boiler pressure; or 12.753 times the square root of the quotient of the indicated horse power by the product of the stroke in inches and strokes per minute. In cylinders where length equals diameter if this gives less than $\frac{1}{4}$ connecting rod length then use 0.0195 times cylinder diameter times square root of product of boiler pressure by square of ratio between lengths of the connecting rod and crank. Thus in a 20'x48", with 80 pounds boiler pressure, the piston rod may be $0.0179 \times 20 \times \sqrt{80} = 3.202$ inches. In an 18'x48" engine indicating 80 horse power, at 75 revolutions per minute, this would make it $12.753 \times \sqrt{\frac{140}{48 \times 75}} = 12.853 \times \sqrt{.03888} = 2.512$ inches.

[THE END.]

Re-Blooming Boquets.

After a bouquet is drooping beyond all remedies of fresh water, the Japanese bring it back to its first glory by a simple and seemingly most destructive operation. A recent visitor to Japan says: "I received some days ago a beautiful bundle of flowers from a Japanese acquaintance. They continued to live in all their beauty for nearly two weeks, and at last they faded. Just as I was about to have them thrown away, the same gentleman (Japanese) came to see me. I showed him the faded flowers, and told him that, though lasting a long time, they had now become useless. 'Oh, no,' said he, 'only put the ends of the stems into the fire, and they will become as good as before.' I was incredulous; so he took them himself and held the stem ends in the fire until they were charred. This was in the morning. At evening they were again looking fresh and vigorous, and have continued so for another week."—*Ex.*

Aquatic Spiders.

Waiting beside a mill pond on a mild, balmy day last March, a slight wind prevailing, but not enough to ruffle the surface of the water, I noticed a spider let himself down into the water from one of the trees bordering upon the pond, and as soon as it reached the water, the web or strand was severed with such a length attached to his person as to act as a sail and serve to assist his propulsion, with the favoring breeze, to the other side.

Numerous spiders followed the same procedure with webs of varying lengths, from three to eight feet. I supposed this was their method of crossing from side to side in search of more abundant food.

I may, perhaps, be only repeating what was before well known, but as it was new to me I give it for what it is worth.—*George C. Henning, Amer. Naturalist.*

MAGNETISM IN MILLING.

ABOUT four years ago the machine illustrated on this page was introduced to millers by the same firm which now manufactures it. Since that time many hundreds of mills have put them into use with the best of satisfaction. During this time the manufacturers have added new features making it more effective for the purpose for which it was designed, viz.: the elimination of all metallic substances that come with the farmers' grain to the mill. With the advent of the wire-binder came the trouble to the miller of all sorts of scraps of iron in his wheat, which found its way to the buhrs in spite of all his cleaning machinery. We all recollect the damage and distress which, in one form or another, was a result of this. The trouble suggested a remedy, and it was found in the magnetic separator, one pattern of which, and the most complete one, this illustration shows. The machine works automatically, hence requires little attention from the miller. Every part of the machine is made in a substantial manner. The illustration readily conveys an idea of its operation. The grain is fed into the hopper, and by the feed roll is distributed evenly the entire length of the machine. It first falls on a heavy plate of zinc, which being a non-conductor of magnetism, the metallic particles intermixed with the grain concentrate until they reach the magnetized sheet-iron where they are held until removed by the wiper traveling on an endless belt once a minute. The magnets are made of the best magnet steel. The sheet-iron placed on the poles of the magnets not only arrests the metallic particles but serves as an armature to preserve the strength of the magnets for an indefinite time. The machine is made in five sizes, and the prices have recently been greatly reduced. For further information apply to Howes & Ewell, sole manufacturers, Silver Creek, N. Y.

New Thermo-Electric Generator.

L. G. Woolley, of Indianapolis, Ind., one of the inventors of the locomotive electric headlight, has invented a thermo-electric generator which is believed by experts to be the beginning of a revolution in the use of the electric fluid. The generator looks like a copper boiler, and stands on the frame of an ordinary sewing machine. It is operated by coal-oil lamps, and the flame of one, not higher than is generally used at night to give partial light in a sick room, furnished a supply of electricity which ran a one-horse engine and illuminated four incandescent lamps. The inventor claims that he will be able to furnish motive power for all purposes in which stationary engines are used at one-twentieth of the present cost. His generator is attached to a telegraph wire running from Indianapolis to Louisville and thence by a loop to New Albany, and with the expenditure of on material except oil in the lamp under the generator is supplying all the electricity needful for telegraphic purposes.

Belting and Gearing.

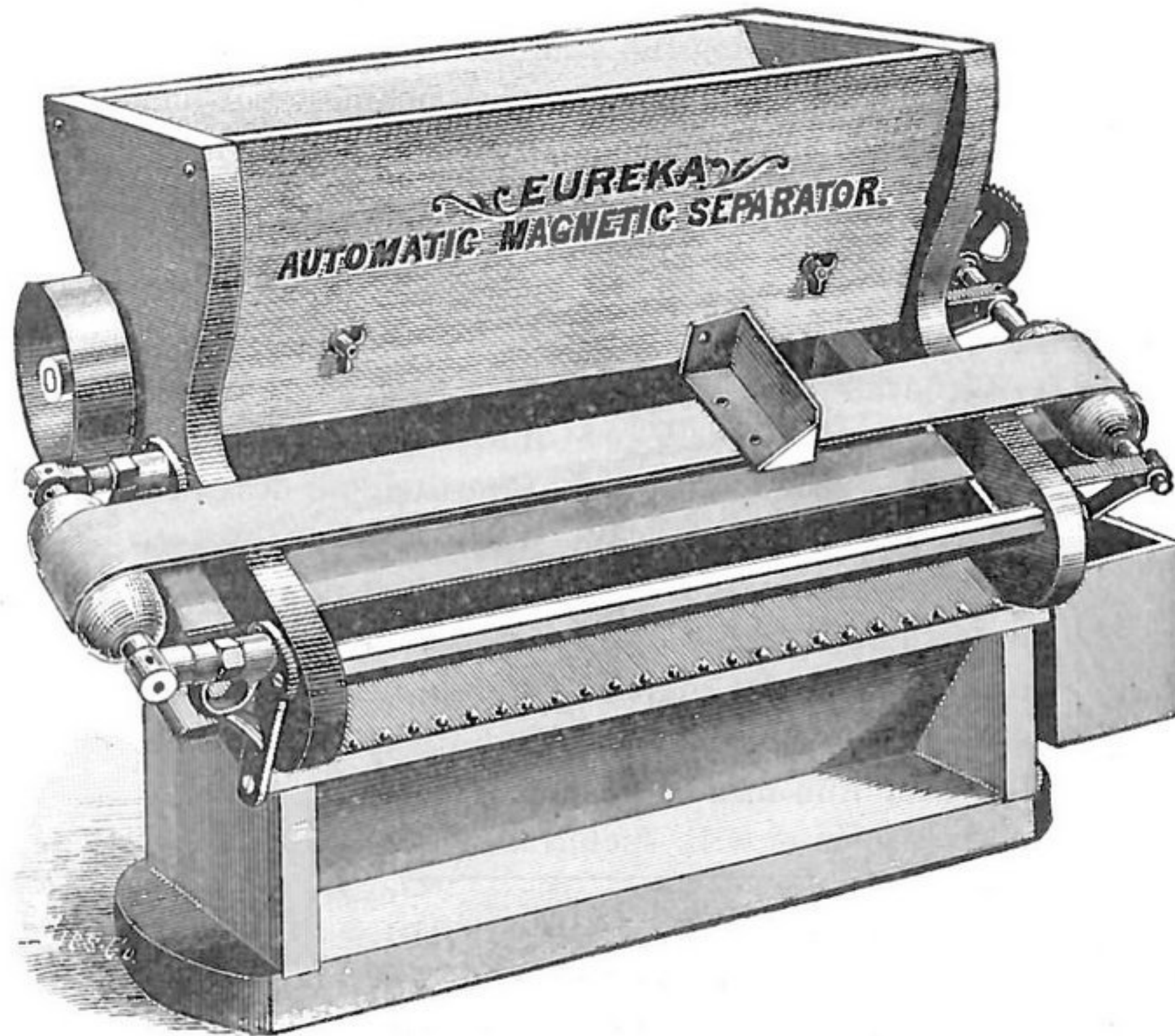
A French writer on the subject of belts, as compared with toothed gearing says: "In regard to the relative friction with belts or cords, and with toothed gearing, it is that theoretically the advantage is always more or less on the side of belts or cords; while a practical confirmation of this conclusion is furnished by the instance of a spinning mill, in which toothed gearing driving 18,000 spindles was replaced by belts, with a saving of 20 per cent. in friction, or $3\frac{1}{2}$ per cent. on the effective driving power transmitted; and in no case do belts cause more friction than toothed gearing."

The Condition of Three Great Nations.

The expenses of the United States, with 56,000,000 people for 1883, were \$265,408,137, and the income \$398,287,000, leaving a surplus of \$132,879,000 to be applied to the debt, notwithstanding \$60,000,000 paid in pensions. The estimated revenue of Great Britain, with a population of 36,000,000, for the present year is £84,000,000 or \$420,000,000. Deducting £8,000,000 or \$40,000,000 placed in the sinking fund for payment on the debt, there is left for all expenses \$380,000,000. How is it with France? She has a population of less than 38,000,000, hardly 2,000,000 larger than Great Britain, almost 20,000,000 less than this country, and yet her national expenses last year were \$605,000,000, well nigh twice those of Great Britain, and not far from three times as large as those of the United States, leaving her a deficit of 73,000,000 francs or \$14,600,000 to be provided for by extra taxation.

Leather Belt Cement.

An ordinary cement for this purpose is wheat flour boiled in oil of turpentine; but the ends must be secured by rivets, or it is not reliable. A better cement is made by soaking six ounces best glue in one pint of ale, then boil, add one and a half ounce of boiled linseed oil, and stir well. Another prescription is to take dissolved glue in the form as



the cabinet-makers use it, and add tannic acid till creamy and ropy. Make the leather surface to be united rough, apply the cement hot, let it cool and dry under pressure and it will not need riveting. For rubber belting, take pure rubber in thin slices, two ounces, dissolve in one pound bi-sulphide of carbon; this is a good cement, but if kept, thickens very soon. In order to prevent this add a solution of pure rubber, rosin and turpentine.—*Journal of Progress.*

Wealth of the Country.

The Census Bureau has finished its computation of the aggregate wealth of the United States, at the date of the census, (1880), and fixes the figures at \$43,642,000,000, the principal items given being as follows:

Farm.....	\$10,197,000,000
Residence and business real estate.....	9,881,000,000
All real estate exempt from taxation.....	2,000,000,000
Railroads and equipments.....	5,536,000,000
Telegraphs, shipping and canals.....	419,000,000
Live stock, farming tools and machinery...	3,056,000,000
Household furniture, clothing, paintings, books, jewelry, household supplies of food, fuel, etc.....	5,000,000,000
Mines, etc., with one-half the annual product.....	781,000,000
Three-fourths the annual product of agriculture and manufactures, and imports foreign goods.....	6,166,000,000
Specie.....	612,000,000
Total.....	\$43,642,000,000



During the past decade there has been an average of 359 hotel fires yearly.

The total output of coal in this country for the year 1883 amounted to 86,000,000 tons.

The woods of the United States are estimated to cover 380,000,000 acres, or 16 per cent. of the total area.

The estimated exportation of wheat from South Australia in 1884 will be 11,000,000 bushels.

Near Salt Lake has been discovered a limesone that produces a flash of light—blue light—at every stroke of the hammer. It is called hell-fire rock.

Condensed milk contains about 10 per cent. of caseine, 2 per cent. of albumen, 10 per cent. of butter, 14 per cent. of milk sugar, and between 2 and 3 per cent. of inorganic matter, which is composed of lime, magnesia, iron, phosphoric acid, chlorine, etc., etc.

It is said that the tooth manufacture of the United States amounts to 10,000,000 teeth per annum. There are twelve manufactories, but one of them, founded in 1864, makes half the number. The value of these teeth is a million dollars. The material of which they are composed are feldspar, kaolin and rock crystal.

The first cotton exported from America was a lot of eight bags sent to Liverpool just one hundred years ago, and the customs authorities detained it awhile because it was reckoned impossible that so much could have been raised here. The crop last year amounted to 6,949,756 bales, of which 4,766,597 were exported.

Besides her 1,300 churches, imperial park, great bridge, and innumerable palatial residences, New York is the second manufacturing city in America. With her suburbs she has 18,000 manufacturing establishments, run by 316,000 operatives, employing \$286,000,000 capital and turning out a yearly product of \$780,000,000.

The largest gold nugget ever found in Eastern America was recently exhibited in Philadelphia. It weighed about four pounds and contained nearly \$1,000 worth of gold. It was found in Montgomery county, N. C., forty miles east of Charlotte, and two miles from Yadkin river in a gully, where it had been washed out from the decomposing rock.

During the past year there has been a decrease of 21,426 in the number of Chinese emigrants sailing from Hong Kong, consequent upon the prohibitory laws adopted by this country and the Australian colonies. Of the 27,657 vessels measuring 5,301,667 tons, which arrived at that port during 1883, but 2.22 per cent. were American, while 49.91 per cent. were British.

An immense necropolis, hitherto undiscovered and unplundered, has been found by Professor Maspero, at Ekhmeem, Upper Egypt. It is roughly estimated to contain not less than 5,000 or 6,000 embalmed dead, of which 20 per cent. may prove to be of archæological or historical value. Part of the remains date from the Ptolemaic period, but it is probable that some of them are more ancient.



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THE mills which have a home trade are the ones which suffer least from the depression of the present times. On the other hand those which have depended entirely upon the foreign trade are the greatest sufferers, in that it is the foreign trade which has suffered the greatest decline in volume of business. About all that the mills are doing now is to supply the domestic demand, and the supply is greater than that demand. There is little or no margin in the business, excepting to those who happen to have a local trade, in which instance competition is not usually so fierce or unreasoning as to entirely remove the margin. As a country without a market for its surplus we must, until proper means are taken to widen our markets, suffer from the ruling of extremely low values and a constantly overstocked market.

GRANTED that the Minneapolis millers are soothed with blank freight rates to the seaboard is that any reason why there should not be a meeting of the National Association this summer, with one object to hear what that committee on transportation has to report?

ALTOGETHER the foreign trade of our mills has been much less during the last year than for many years previous, and considering the unsteady way in which our mills have run it shows that our milling capacity is much in excess of the home demand. It shows that in order to run steadily that there must be a large foreign demand, and considering the state of affairs, the supplies of wheat and flour to foreign markets from countries other than our own at lower prices than we can produce, it looks as though we were going to run another year on the expectancy rather than on the surety of better times.

A COMMITTEE of the Chicago board of trade is visiting the large cities of the country to secure the coöperation of the grain and produce exchanges in an effort to suppress "bucket-shops." We suggest the most effectual way to suppress "bucket-shops" would be for the Chicago corporation of speculators to suppress itself; or, a more effective and just procedure, let the national government suppress it, and thus by one stroke rid the whole country of the curse. Why the big-tub gamblers should exist and the little-bucket fellows have their business bottoms knocked out is not plain either in reason or equity.

EDW. P. ALLIS, if he is at the head of "the largest mill furnishing establishment in the world(?)" is of mighty small consequence in a Greenback national convention. For the nomination for president recently out of a total vote of nearly 500 he polled just 2. But then he wasn't a recognized candidate. We must say for the vote he did get, that the delegates who cast it would do honor to any man in their intelligent estimate of what a presidential delegate should be. George O. Jones, of New York, who is a large miller, we believe, rode him into the arena, and any man might well be gratified with such a knightly advocate.

We think that many of our small mill friends have made mistakes in throwing out all of their millstones. Not that they have put in too many rolls, for that is not so. Those who have tried to finish up the red dog stock with the ordinary plant of a mill from seventy-five to a hundred and a hundred and fifty barrels per day have no doubt found it a matter of some difficulty. Now if they had put in the same number of rolls to make the same amount of flour and left a pair of the old millstones at the tail they would be in better shape for making cheap flour. There has been more or less of sentiment in this matter of all rolls for small mills.

OUR shot at the scratch rolls in the last number of THE MILLSTONE hit the mark. Our cotemporary the *Roller Mill*, calls for time. Its charge on the porcelain rolls was evidently a mere mask to boom the scratch rolls. Our interest in this matter is that of the milling fraternity at large. We wish to see good milling, and wherever there is a pair of scratch rolls in a mill there is a weak spot. Scratch roll reduction has all the faults of a millstone reduction and none of the desirable elements of a smooth roll reduction. They pulverize bran and fibrous impurities and all alike. A good reduction is one where the desirable flour stock is reduced either to middlings or flour, and the impurities are left in a separable condition therefrom. This definition entirely excludes scratch rolls as they make no distinction in this respect.

THE *Roller Mill* backs down very gracefully from the implication that the question of dress can have anything to do with the capacity of rolls, and narrows down the question of difference of capacity upon which THE MILLSTONE and the *Roller Mill* so radically disagree, to that of the proper speed. The position of THE MILLSTONE is that the best work can be done at a speed not greater than 225 revolutions per minute. The *Roller Mill* holds that 350 to 400 revolutions per minute is better. We can support our position by reference to a number of mills which would develop the fact that the best practice sustains our figures. But we cannot think that it is an agreeable position in which to place our friends by making them the butt of a controversy. If the *Roller Mill* should make mention of mills representing them to do most excellent work with rolls running at the speed which it suggests, we would not feel like contradicting it as to the quality of work done in such mills even if we knew ourselves to be in the right.

We call to mind a conversation had with a prominent spring wheat miller recently when this same question of the speed of rolls came up. He asked how fast break rolls were usually run in this part of the country and we answered that we supposed that somewhere from 240 to 280 revolutions would be the average. "Whew!" he said, "that would knock our wheat, bran and all into smithereens." We asked him what he was doing, and he answered "200 to 225," but that if he could have his own way it would be the former instead of the latter in every instance. Now it is true that the evil results from high speed of the rolls will not show so plainly on winter wheat, but the fact that it is apparent with the harder spring wheat shows plainly enough what is best in any case. As sustaining our position in this matter we have the best practice in Hungarian mills.

The *Roller Mill* says: "In the meantime it is obvious if two rolls of the same diameter be run on at 400 revolutions and one at 200 the former will pass twice as much surface in a given time as the latter and therefore will have practically double its grinding surface. From this standpoint it will be seen that the 252 inches of grinding surface provided for in our table would be more than equal to the 468 inches which THE MILLSTONE requires. That is not so. As the rolls increase in speed they do not proportionally increase in capacity, for if they did, why not run them at 600 or 800, for we have it from the *Roller Mill* that the higher speed improves the character of the product.

But to cast aside the advantage from any argument of this kind, it is apparent that the capacity of rolls is limited when it comes to the point that their speed of revolution is greater than the speed of the stock from the feed roll to the grinding surfaces. It is entirely possible for the rolls to be empty part of the time through excessive speed while there is stock coming over the feed roll.

THE political events of the last few weeks at least call for passing mention. It is the business men of the country who have the real business interest in politics. It cannot be that a journal whose object is the good of one branch of the general business of the country should entirely ignore or fail to mention an important political event. A business, trade or commercial journal cannot rest its foundation on party or party policy. Its basis must be something broader and wider than the confines of party policy. A trade journal ought to be the representative of public good, and the principles which lead to public good and advancement cannot and do not belong to a single party. It is popular sentiment and feeling that make the politician and not the politician who creates popular sentiment and action.

The politician is the public's servant in the fullest sense of the word. He is led and driven; generally he is a stubborn servant. He rarely takes an advanced step until it is a question between moving and getting out entirely. The great political lights of whom we hear and know are not men of great ideas. A man cannot be original, in its true sense, and be a politician. He cannot be possessed of a bright, tender, sensitive and acute mind and be successful in this line. Generally speaking a politician is a man possessed of a large element of coarseness with the faculty of subduing it when in superior company. There are those among business men, literary men and those engaged in the quieter pursuits who really make public policy. It is from this direction that most improvements and changes emanate. When we hear people talking about corruption, and the extent to which it may be carried, and predicting general ruin and disaster, it should be remembered that there are quiet, forceful people sitting back attending to their own affairs, who, when they see things going too far, dip in an oar and change the direction of things. Ideas and principles which are now being avoided and spurned by both parties, and those which are receiving the strongest opposition, are sure to be recognized in the future as a part of the acknowledged public policy.

WRITERS in several agricultural journals are disparaging Indian corn as a food for live stock. Some of them go so far as to say that it is an unfit food even for swine and poultry, basing an argument upon the false assumption that corn is far less rich in phosphates than other of our important cereals. They declare also that there being an almost total destitution of bone and sinew forming qualities in corn, and absolutely it is a fat-forming and heat-giving food, it should be put aside for the purposes mentioned. We submit herewith a table compiled by an eminent American authority, showing a comparison between corn and wheat:

CORN.		Percentage.
Water	14	
Muscle makers	12	
Fat formers and heat givers	73	
Phosphates	1	
WHEAT.		Percentage.
Water	14	
Muscle makers	14.6	
Fat formers and heat givers	69.8	
Phosphates	6.1	

From this it will be seen that while corn is richer in fat-forming and heat-giving qualities, it is by no means so devoid of sinew and bone-forming qualities that its use as a food product for brute or human kind might wisely be dispensed with. If corn is responsible for the increasing fatality among working animals and those which furnish mankind with meat products, in like measure it must be a fatal substance for human food. Indian corn, more than any other cereal grown in this country is a carbonaceous food, and it is not far from being as rich in phosphates and muscle-making elements as our staple product, wheat. It is in nowise an unfit food when used as it should be to derive the best natural effects.

THE action of the grain dealers of Indiana, who effected a permanent organization for mutual protection at the recent meeting in this city, supplements the attempted project of the millers who met here two months ago. It would be well for Indiana millers to aid the proposed action of this body, by becoming active members thereof. No class of men suffer more from false inspection and undergrading by elevator men and boards of trade than do the millers, and as it seems impossible for the millers of this state to hold together an effective organization of their own, the next best thing is to join with those who are identified with them in reform of existing abuses.

WE are having made a chemical analysis of the numerous varieties of foreign wheats which come into direct competition with the American grown article. These experiments are conducted by Prof. A. W. Brayton, who has a national reputation for his impartial and complete analyses of food products, assisted by Prof. J. N. Hurty, proprietor of one of the most complete chemical laboratories in the country. The samples include representative grades of Indian, Australian, Russian, South American and Mediterranean wheats, ten samples in all, and a comparison will be made of them with the hard and soft spring and winter wheats of this continent. The purpose is to show in a manner not heretofore given the relative flour-producing value of the different grades, setting forth in the best light possible the economic feature of these wheats in comparison with the American product. The comparative tests heretofore made have not shown this phase of the question in a manner free from self-interest, but it is proposed in these experiments to demonstrate the actual value of the wheats in determining their qualities as food products and their economy as milling materials. The point aimed at, in a commercial sense, is to show the true relation these foreign grains bear to our American product—which are superior and inferior to our leading grades; and in what respects and under what conditions. We think this will be highly interesting matter, and hence we do not scruple at any expense in getting at the truth of the subject. Such an analysis has not heretofore been presented in the impartial light in which we expect to show it.

THE quality of milling machinery at this time is much better than ever before. With the change of system and method which called for more machinery for the same amount of work, there was a corresponding improvement in quality. All the details have been improved, the proportions have been altered to meet the exact demands. The appearance has not been neglected. Milling machinery as now made is quite handsome. The roller mills as compared with those first designed show this change quite clearly, or to make a more apt illustration compare the hurst frames or buhr mill frames, portable or otherwise, with those of former years and this difference of appearance is at once decidedly apparent. Again there are the straight-armed pulleys and, in fact, all the details and arrangements not only are better as to quality but better as to appearance. Changes of this kind come as there are demands for them, not before. No man is going to make a thing for which there is no call, but as soon as there is a demand there will be many to supply it.

A PROJECT is on foot to hold an exhibition of American products, agricultural and mechanical, in London next year. This will strike the average Yankee as a big undertaking. To go to the very capital of our leading competitor and open out a big show of Yankee thrift and ingenuity would no doubt astonish the natives. We are great enough in resources for making a display such as the Old World has never seen, if we have a mind to do so. That such an exhibition will be encouraged by the people over there is not to be expected; that it will receive the support of our manufacturers and producers here to any great extent is doubtful. The time is not yet ripe for such an undertaking on a scale that would be creditable to us as a nation of producers. American goods must get a firm foothold there in some more conservative manner than by a spontaneous general effort through a big exposition. To come down on them like the Assyrians of old would more likely scamper the trade, rather than coax it to us.

AN "old timer," says that during "the year without a summer," which is remembered as the year 1816, the cereal and fruit crops were so thin, wet and of such poor quality, that little use could be made of anything grown. The mothers of that day could not bake bread from the flour furnished until they had first heated their flatirons hot and ironed it out(?). Then the sponge wouldn't rise. The bread was baked and had a sweet taste but was so gummy it was almost impossible to swallow it. It was a serious state of affairs all around, and was accounted for from the numerous "spots on the sun" which were then visible through smoked glass. The same sad state of affairs now exists in the matter of bread making, but instead of ironing out the flour to dry it, the wives and daughters of the present generation make it up into bed-ticks and pillows and sleep it dry. We indite the last sentence for posterity to show that expedients in getting around natural difficulties are just as ingenious and effective nowadays as they were 'way back in 1816, or as they are likely to be in 1916. The same spots are on the sun; the same tornados tumble and toss and scar the sweet face of Mother Earth; it blows hot and cold just as it did then, but our wives and daughters can now go to the town bakery for bread kneaded by machinery and baked in ovens as big as coke furnaces, something it was not possible to do "way back in '16."

TALMAGE's estimate of the coming harvest appears on another page. The report shows a total of 516,000,000 bushels of wheat. With this immense yield, and the 80,000,000 bushels of the previous crop it is estimated will be left over to be added to it, the question naturally arises what are we going to do with it? Foreign advices report over 460,000 quarters more of wheat in London than at the same time last year. The crops on the Continent, in India, Australia, and from everywhere tributary to the English market, promise good. Add to this our decreasing prestige in supplying the demands of the European markets, and the outlook for disposing of our surplus from the coming extraordinary harvest is dismal enough to satisfy the most ultra believer in the nation's ability to consume what it produces!

THE MILLSTONE believes that wheat will be lower during this crop year than for many years past. Because: our cost of living is artificially so great and our trade with other countries is so hampered that we are unable to accept their goods in exchange for ours upon an unrestricted basis, thus forcing those who formerly bought our surplus to look elsewhere. Thus it is the indications are for a big crop and no market to be had for that portion of it we cannot use ourselves. The signs are for another year of hard milling.

THE Chicago board of trade cut off the Indianapolis board's quotations under the claim that the local "bucket-shops" had unrestricted use of them, and the latter board was evidently not making much of an effort to prevent such a misappropriation of valuable favors. It is not likely the Indianapolis board could have prevented the outgo of the quotations, even if it had been so disposed. The relationship of Indianapolis "bucket-shops" to the board is just that far apart that individuals may be leading members of the one and energetic proprietors of the other.

THE *Millers' Gazette*, of London, has been boycotted by Irish millers because of its advocacy of modern ideas in milling. That would be possible only with a few of the milling journals on this side.

OUR invitation to the Minneapolis head millers' picnic and excursion, which came off at Minnetonka beach on 21st inst., was printed on a miniature flour sack.

PALMER, of the *Northwestern Miller*; Seybt, of Highland, Ill., and Kratochwill, of Dayton, O., will be the only Americans so far reported, who will attend the convention of British millers this month. It's a good combination—to talk. A London milling journal is authority for the statement that the princely editor above mentioned will represent President Christian, of our national association; Seybt, it is presumed, will represent the exporting element among our millers, and Kratochwill will represent a fair sample of a practical American miller. If pools were sold on this combination as to which one of the individuals named would "paralyze" the Britishers in the quickest and most expeditious manner, one would be compelled to buy the pool box to be a sure winner, they are so evenly matched. Taken all in all, a better trio could not have been selected to represent the journalistic, shipping and manufacturing features of the milling industry of this country.

FOR the five months of the present year the fire loss in this country aggregated \$46,750,000. These are appalling figures, and would seem to justify the action of the insurance companies in raising rates. But we must not forget the fact that insurance companies have never yet thought of lowering rates after seasons of extraordinary immunity from loss, when their dividends were replenished by high percentages of profit. The Golden Rule does not work where insurance companies are interested. The new standard rates of some companies on flour mills is an instance in point. Conceding that such risks are hazardous, it cannot in justice be denied that millers are required to pay higher premiums than the companies demand from other interests comparatively much more hazardous, as the number of losses among these, such as hotels, theaters etc., indicate. It is not always that underwriters fix the rate on what the risk is in fact, and in the case of flour mills it is quite evident the rate is made for what they seem to be. The millers' mutual companies rate is the plainest evidence of that truth.

The Last of the Mohicans.

Mr. Joseph Lacroix has sold the patents of his father Nicholas and E. H. Lacroix to the Geo. T. Smith Middlings Purifier Co. The main consideration was not large, but there are other features in the transaction which places Mr. Lacroix in a very comfortable position as far as competency is concerned. He is retained by the Smith Company for a period of ten years as an expert in any matter of patent litigation which may come up; furthermore, is to act as a milling engineer and adviser in certain matters pertaining to the business of the Smith Company. It is a part of the agreement that Mr. Lacroix is not to take out any patents on improvement in purifiers or centrifugal reels on his own account. This transaction amounts, as Mr. Lacroix expresses it, to "turning himself over to the Smith Company."

Mr. Lacroix started for Europe on the 12th inst. It is his intention to look up some milling matters while there, particularly to see the results of French milling experiments. In the latter connection it will be remembered that the government, under the direction of the millers, has built three experimental mills, one a full roller mill, another a combination of stones and roll, and the third a buhr mill, all as complete as may be, this being done to save each milling firm trying the experiment for itself, as was the case in this country. Mr. Lacroix will also represent the Smith Company while abroad, looking after the matter of some of their recent patents and the introduction of their machinery. This part of the business will also call him into Russia. With this acquisition of talent, and tangibility in the form of patented features, the Smith Company have about "cleared the decks."

[For The Millstone.]

SELF-SATISFYING MILLERS.

WALTER H. WATSON.

IN the working out of a decided change in anything, where the result is somewhat uncertain, where there is hope and expectancy for better things, there is always a certain amount of enthusiasm and sentiment. Self-laudation and personal satisfaction in the various stages of such a work are inseparable from true industry and zeal. All this is exemplified in every reform movement, no matter whether it be a public or a special matter. During the period of the recent milling transition this condition was clearly marked. Millers talked about the things which were on their minds with great volubility. They were enthusiastic. They made statements, one day in all confidence and earnestness which they renounced the next day or the next week. The writer has known millers to start out on a visiting expedition and because of their excessive interest in their own proceedings, they would spend all their time while away from home in talking about their own work and their own methods. They would walk through a mill and everything which they saw would remind them of something which they had at home and in regard to this they would proceed to expatiate. All this is calculated to remind one of a very worthy old gentleman pictured in George Eliot's "Daniel Deronda," who during the time that he was being shown over a very large estate could not be made to understand the true elegance of things around him because every new thing brought to view and every suggestion made was a basis for a reminiscence. Young men and old men and very enthusiastic middle aged men are always full of reminiscences. During the time of a millers' national convention I remember to have noticed a large gathering of millers who were talking mill, and who, with one single exception, took not a particle of interest in what the other was saying, only to wait for him to get through that they might have a chance. And of those who visited the mills I remember of only one who was lost to himself. He was a miller from northern Ohio. He was under and on top of all the bolting chests and other approachable machinery in the mill, said nothing about his own methods but merely made it his business to learn all that he could from others without special reference as to what they thought of him. On another occasion I remember of meeting a miller who had been visiting mills in a certain town in Ohio.

"Well, what did you see over there," was asked.

"I was in Mr. K's mill," he said, "and he is grinding out bran that feels like hazelnut shells."

"Making nice middlings?"

"Oh! yes, but I straightened him out on his clear flour. Told him a trick or two that fixed him up all right. He said that he had been trying to get out of that trouble for a year."

It was afterwards learned that the only suggestion which he made to the miller in question was that if he would patch his bolting cloths he thought that there would not be so many specks in the flour. In truth, there was nothing the matter with the bolting cloth as to its condition, and the only thing which made the flour specky was the high grinding and a coarse scalper which allowed a great many middlings to go into the flour reels and thus bolt a little specky. However, this fact did not prevent this flour from being one of the best known clear flours in the market at that time, and as I happen to know this miller is supplying the same trade to-day approximately the same flour. While he has always been foremost in the machinery changes, he has never varied the quality of this particular grade—

the only difference which changes of machinery changes of methods have made in the results applied to this brand has been in the matter of cost, its decrease being effected by the difference in percentages, owing to superior methods of manufacture.

This feeling of self-satisfaction does not apply to the millers alone, but to the mill builders as well. This has been developed and fixed more firmly in the minds of the latter class by the disposition of those who have to sell, to claim to have the best. In an endeavor to influence a purchase, to indicate to the desired purchaser that the goods offered are superior, and in such expressions, there is a development of sincerity as apart from trade statements. Every man who comes to a miller with a special piece of machinery gives many reasons why he has the best, and as a trade statement, as before expressed, he is sincere. As salesman he recognizes only the good points in his stock. There is nothing so bad but that there is some good in it. If we take that good and think and talk of it, only that which is bad is forgotten, and through the bias of our own desires a sincerity of belief is formed which readily and forcibly impressed upon others. It is not the business of a competitor to see the good points in another's offering. In the case of a machine none can be so good or so complete but with faults, real or imaginary, may be found in it. Universal excellence is an unheard-of thing. From this standpoint it is entirely possible for a competitor to form a very sincere and very unfavorable opinion of a very good but competing machine.

All this implies a narrowing process—a concentration within the limits of one's resources. There are outside and floating influences, which to those who have eyes and ears, prevent an entire settling into selfish ideas. But it is this spirit which often makes the gaining of knowledge a slow process. It is the spirit which has made the gaining of mill knowledge a slow process to so many, and in proportion as it has been slow it has been expensive.

It is not expected that every miller will take every other one in, and in the goodness of their hearts tell each other everything they ever knew, but the principle that a fair exchange is no robbery—such an exchange might be made, and while it cannot be expected that rival makers of machinery will help to sell another's goods or even refrain from suggesting weaknesses, it is well to remember what is said to the jilted, that "there are as good fish in the sea," etc., thus leaving the mind in a condition for rapid rather than forced and slow progress.

The Discovery of Coffee.

An Arabian legend gives the following account of the discovery of coffee: About the middle of the fifteenth century a poor Arab was traveling Abyssinia, and finding himself weak and weary from fatigue, he stopped near a grove. Then, wanting fuel to cook his rice, he cut down a dead tree which happened to be covered with berries. His meal being cooked and eaten, the traveler discovered that the half burned berries were very fragrant. He collected a number of these, and crushing some of them with a stone, he found that their aroma increased to great extent. While wondering at this, he accidentally let fall the substance into a can which contained his scanty supply of water. Lo, what a miracle. The almost putrid liquid was instantly purified. He put it to his lips—it was fresh, agreeable; and in a moment after the traveler had so far recovered his strength and energy as to be able to resume his journey. The lucky Arab gathered as many berries as he could, and having arrived at Aden, in Arabia, informed the Mufti of his discovery. He tried an infusion of the roasted berries, and was so delighted that, in gratitude to the tree, he called *cahuab*, which, in Arabic, signifies force,

HEARKEN UNTO HURD.

THE tariff speech of the Hon. Frank H. Hurd, of Ohio, some time since, in the House of Representatives, while it contains a great deal of matter which is of general interest to the people at large, is of special interest to those engaged in the manufacturing of agricultural products, as in the case of the miller who works the wheat into flour. We give a few paragraphs from the more interesting portion of the speech.

FOREIGN TRADE IN GENERAL.

Trade is mutual exchange; and foreign trade is exchange of the productions of citizens of this country for the productions of the citizens of other countries. Every hindrance to the importation of foreign goods is an embarrassment to commerce. It prevents foreign goods from coming in, and to the same extent prevents domestic goods from going out. You cannot have large exportations without having large importations. There is not a dollar's worth or a pound of foreign goods that can come into America without a compensatory pound or dollar's worth of American goods going out. Just as you keep the foreign goods out so you keep the American goods in.

DECLINE OF AMERICAN SHIPPING.

More injurious still is this protective system to our carrying trade. In 1855 we built in this country 400 vessels for the foreign carrying trade; in 1879 we built but 35. In 1857 Great Britain had 950,000 tons engaged in trade between that country and this, but now she has nearly 6,000,000 tons. In 1857 we had engaged in the foreign trade over 4,000,000 tons; now we have scarcely 600,000.

A distinguished officer of our navy told me that on his first trip to South America, in 1859, more than half of the flags he saw in South American ports were American flags, and that when he went down there four years ago he did not see the flag of this country at all except upon vessels owned by the government. So completely has this carrying trade passed under foreign control that last year we paid in freight \$120,000,000 to foreign vessel-owners.

Mr. Chairman, nothing is clearer to my mind than that the destruction of our foreign carrying trade is the result of prohibition of American registry to foreign-built ships and the high price of materials for ship-building which the tariff occasions. There is nothing so humiliating to an American as this decadence in our shipping and our foreign trade.

AMERICAN WHEAT TRADE.

We have a surplus of more than 100,000,000 bushels of wheat from last year, and this surplus must increase rather than diminish. It must not be forgotten, as I said a while ago, that this wheat finds its market in Liverpool in competition with all the wheat of the world. The price of the wheat there is determined by the competition. This competition not only fixes the price of the wheat sold there, but of every bushel sold at home. It is the Liverpool market which determines the price of wheat which may be sold at Chicago, Toledo, Milwaukee or any of the great grain centers of the West.

Now, sir, this foreign market so indispensable to the American agriculturist, who always will produce a surplus to be sold abroad, the protective tariff embarrasses and threatens. It is a continual menace to it. It has already robbed America of half of the markets of the Old World and of this. The high duties in Germany and France and Italy and Spain and Portugal and Canada and Mexico are kept up avowedly in many instances in retaliation for the high duties we have against them; and thus this protective system has armed the people of all these great countries with an excuse for keeping out this surplus of American grain.

Why, Mr. Chairman, under wise modes of legislation and with wise reciprocity treaties negotiated between this country and other nations, we could in less than six months, I believe, open the markets of 150,000,000 of people to the grain of the farmers of this country.

THE INDIAN WHEAT TRADE.

After the countries named had imposed high duties on our products there was little left of our foreign market except what England and the free cities of Germany afforded. And England, because the American tariff prevents the importation of English goods, has sought to find her food supplies elsewhere. Under the impulse of this necessity the most amazing fact of modern times has been developed. India, old and effete, from whose territory very little exportation had hitherto been made, is becoming to Great Britain the source of her grain supply. Under the influence of the Marquis of Ripon, who went out as governor-general about four years ago to that country, the Indian Government was induced to abrogate its protective tariff, and the vast markets of 220,000,000 of people were opened to the operations of the principle of free trade. Instantly the attention of England was directed to the agricultural development of that country.

ENGLAND'S POLICY WITH INDIA.

This policy has been carried out, and under Ripon's administration, as I have said, India has adopted commercial freedom. Immediately Great Britain commenced the development of India's agricultural production. Large extents of territory were made cultivable through the adoption of systems of irrigation. Railroads were commenced and the work of construction vigorously pushed. The interior was thus opened up to the coast, so that the products of the soil could be cheaply loaded in the vessels. Then the most suitable seeds were distributed among the people. Cheap agricultural machinery was afforded them. Under this impulse, wheat production was so stimulated that last year there was a production in India of more than 300,000,000 bushels, of which a large portion was a surplus above domestic consumption. Of this 40,000,000 of bushels have been exported, while five years ago there was scarcely a cargo of grain sent from the shores of that country. In the first three months of this year this exportation has largely increased over the same period of last year, indicating for this year an exportation of nearly 70,000,000 bushels.

THE EFFECT ON AMERICAN TRADE.

What has been the effect of this increased production in

India upon our markets? In the last nine months there has been a decline in the exportation of American cereals of \$47,000,000 in value, and wheat has gone down in Chicago to less than 80 cents a bushel, the lowest price ever known in that market. It is notable, Mr. Chairman, that just as the exportation of wheat has increased from India, the exportation of wheat has diminished from the United States. This development of wheat production in India is the natural and the inevitable result of the protective tariff in America, which puts high duties on foreign goods. England refuses to buy of the farmers of America, who will not take her goods in exchange, and seeks her food supply from those countries who will take her productions; and thus from the farmers of America is passing away the last vestige of a foreign market.

I say to the farmer of America that the prospect for him is by no means encouraging. With elevators, granaries, and warehouses all filled to overflowing, with the old crop still unsold, with the vast fields of the great West greening to the coming harvests, with crops unexcelled in India, almost ready for the market, with splendid promise among all the wheat-growing nations of the earth, and with the price of wheat less than 80 cents at Chicago, I predict that before January next the price of wheat will be so low that it will not pay for the cost of production, and the corn raised on the Western prairies will be burned again for fuel as was the case years ago. When that time arrives the farmers will be beggars in the midst of their own plenty and paupers by the side of their own golden gathered sheaves. There is absolutely no relief to the American farmer except in the making of foreign markets for him. Talk about the home market which the American manufacturers make for him! Already their demand for agricultural products is diminishing; already they are complaining of over-production everywhere. It is not in their power to consume what the farmers of this country can produce. There are, Mr. Chairman, but two ways in which the farmer can find relief. One is for the proper authorities to make reciprocity treaties by which the markets of other nations will be open to the products of this country, and the other is for Congress to reduce the expense of living by cutting down the tariff rates.

ENGLAND AND AMERICA AS MANUFACTURERS.

Our manufacturers have not markets large enough; they have surrendered the markets of the world to England. Last year England sold abroad \$1,500,000,000 worth of manufactured goods, and America, exclusive of manufactured products of agriculture, sold abroad barely \$70,000,000 worth. Fifteen hundred millions of dollars for that little stormy island, and \$70,000,000 for this continent! Yet we have opportunities and advantages vastly superior to hers. She has to go thousands of feet under the land and sea to get her iron and coal, and go thousands of miles over the land and sea to get her cotton and wool. We find here our iron and coal close to the surface, on the mountains and hillsides, and can tumble them together into the furnaces. We have the vast cotton-fields of the sunny South and the wide pasture-fields of the West for sheep to give us abundance of cheap cotton and cheap wool. It is an ineffaceable stain on the American name that the markets of the world have thus been surrendered to Great Britain, our great rival. Think you that if we could have sold abroad of our manufactured goods \$1,000,000,000 worth last year there would have been this stagnation, overproduction and depression?

Tanning Linen.

A Belgian inventor, M. Piron, has invented a method of rendering cellulose tissues impermeable and very durable, without injuring their flexibility, and without much increasing their weight. By examining the bandages of the Egyptian mummies he inferred that the best preservatives would be found in the vegetable kingdom, and he has given preference to the green tar of birch bark, which furnishes the perfume of Russia leather. The tar forms, with alcohol, a solution of great fluidity; but when once dried it becomes resinous and resists the solvent power of alcohol. It can be combined with the most brilliant colors. These qualities enable it to penetrate the capillary vessels of tissues, covering them with a varnish of great elasticity, which resists the corrosive action of acids, sea water and changes of temperature. The density is very small, so that the tissues are made impermeable with a slight increase of weight. The prepared stuffs can be folded without scaling. The aromatic odor drives away insects. Microscopic vegetation cannot grow, because neither air nor water can penetrate into the interior of the fibres. The invention can be applied to all vegetable tissues, such as sail cloths, cordage, awnings, curtains, etc.—*Chron. Industr.*

Does Not Include the Solacing Pipe.

There were 3,177,860,000 cigars made in this country last year, and 35,000,000 imported, making 60 for every man, woman and child, or 250 for every man over 21. New York City is the center of the manufacturing business. It has nearly 4,000 factories, employing 20,000 men women and children, and makes 1,000,000,000 a year.

BRAN DUSTERS.

IN the list of cleaning machinery required in a properly arranged flour mill, no other machine holds a more useful and necessary place in the equipment than the Bran Duster. It has not been many years since they were looked upon as mere incidentals, something that might be dispensed with and the work that they perform taken up and disposed of by machines specially created for other purposes, but that was before millers had come to realize that there is so much valuable flour material to be had from the proper treatment of the bran. The advent of the roller process of grinding brought out the utility of bran cleaning as being one of the greatest saving, and consequently necessary parts of successful milling, and hence we find to-day that the modern bran duster is among the first machines to be considered in purchasing an outfit.

Prominent among the machines of this character that has held favor with millers in this country and Europe is the Excelsior Bran Duster, manufactured by Aug. Heine, of Silver Creek, N. Y. The Excelsior has been before the milling public for twenty years, during which time all the ingenuity of the manufacturers has been applied to make it the very best machine of its kind, and that their efforts have been appreciated, is proved by the fact of the vast number now in use, and the continued large demand for them. The manufacturer claims for the Excelsior that for yield and quality of flour produced, durability, simplicity of construction and other points of merit, including adjustability, it has no rival. Like all the machines from this concern it is put together out of the best material, simple, strong and durable—mechanically perfect—and it is claimed takes less power than any duster in use. A special feature of the machine recommending it to roller millers is that it has an iron case, the old style wooden case which is used in most machines of this class being discarded as not suited to the warm bran peculiar to roller milling. The iron case before mentioned is held in place by a strong hard wood frame in such a manner that the material treated can in no wise come in contact with, or affect the same. This construction gives a much stronger and durable machine.

A further use for the Excelsior Iron-clad Bran Duster is found in its adaptability for handling germs from smooth rolls, either direct from the rolls, or after passing through a bolt. The action of the brushes on the flattened germs before they become quite cold and brittle is astonishing, as every vestige of flour is taken off, and the germ discharged flat as bran. When used for germ dusting the cylinders are clothed with a very heavy wire cloth of suitable mesh, expressly made for this machine.

That the proprietor has full confidence in the merits of the machine to do all he represents it to do, he has made a special offer, to hold good for the next ninety days, that any miller wishing to avail himself of the opportunity of purchasing a machine under the condition of its saving its cost in a short time, he will ship a machine to any mill of ten barrels capacity and over, on condition that it is to be set up in the mill within a reasonable time after receipt of same, and is to treat all the coarse and fine bran made in the mill, and to be paid for in installments of \$50, as fast as the savings so effected by its use amount to enough to pay for it. By this arrangement the most conservative can acquire this valuable piece of machinery without cost, and if after thirty days' trial, parties want to keep the machine a liberal discount will be made for cash. That is certainly a liberal offer, and worthy the consideration of any miller desiring to purchase a machine of this character, but uncertain in his judgment of which is the best to be had. Any further information respecting the Excelsior can be had by writing to the manufacturer, whose address is given above.

MILLING PATENTS.

[The following list of patents relating to the milling interests is specially reported to THE MILLSTONE by Franklin H. Hough, Solicitor of American and Foreign Patents, 617 Seventh street N. W., Washington, D. C.]

ISSUE OF MAY 13, 1884.

No. 298,387—Middlings Purifiers and Roller Mills, Automatic Self-feeder for. W. M. Jewell, Denver, Col.

No. 298,341—Mills, Electric Work Indicator for. A. D. Blodgett, Boston, Mass.

No. 298,461—Millstone Dressing Machine. D. S. Greeley, Foster's Crossing, O.

No. 298,428—Screen for Attrition Mills, Etc. T. L. Sturtevant, assignor to Sturtevant Mill Co., Boston, Mass.

ISSUE OF MAY 20, 1884.

No. 299,077—Fanning Mill. A. W. Kendrick and C. A. Van Duzee, Brooklyn and Gouverneur, N. Y.

No. 298,904—Grain Mixing Machine. J. L. Sheppard, Charleston, S. C.

No. 298,900—Middlings Grading and Purifying Machine. J. M. Shultz, Minneapolis, Minn.

No. 298,938—Mills, Purifiers Etc. Feeder for. W. S. Bonnard and W. H. Grupe, Terre Haute, Ind.

ISSUE OF MAY 27, 1884.

No. 299,245—Flour Refiner. I. Morgan, assignor of 1/4 to C. H. Caggs, St. Louis, Mo.

No. 299,204—Grain Drying Machine. B. S. Cullen, Mankato, Minn.

No. 299,375—Grain, Reducing Lobated. L. Gathmann, Chicago, Ill.

No. 299,446—Grain, Grading and Sorting Machine. W. E. Wild, Loveland, Col.

No. 299,340—Grinding Mill. C. C. Burner, Travelers Rest, W. Va.

ISSUE OF JUNE 3, 1884.

No. 299,863—Bag Holder and Weigher. C. Shirley, Luzerne, Iowa.

No. 299,683—Drying Machine for Grain, Etc. E. H. Swain, Gardner, Mass.

No. 299,790—Flour Bolt. N. W. Holt, Buffalo, N. Y.

No. 299,784—Flour Bolt, Centrifugal. A. Heine, Silver Creek, N. Y.

No. 299,647—Flour Bolting Machine. G. C. F. P. Janssen, Hamburg, Germany.

No. 299,684—Flour, Etc., Machine for Bolting. L. J. F. W. Scharbay, Hamburg, Germany.

No. 299,834—Hominy Mill. M. L. Mowrer, Newark, N. J.

No. 299,789—Roller Mill. N. W. Holt, Buffalo, N. Y.

ISSUE OF JUNE 10, 1884.

No. 300,219—Flour from Barrels into Bags, Portables Table for Transferring. W. Cochrane, Brooklyn, N. Y.

No. 300,103—Millstone Dressing Machine. J. Miller, Milton, Oregon.

Wing's Clipped.

A dispatch from St. Louis dated 20th inst., reports that D. L. Wing & Co., owners of the Planet flouring mill, at Litchfield, Ill., were embarrassed, and would probably be obliged to suspend. Full particulars are not obtainable, but it is known that a considerable amount of Wing & Co.'s paper, drawn on Mr. Downing, of the firm of Downing, Shirtwood & Co., of Springfield, Mass., who was formerly a partner of Wing's has been protested, and that Wing left for New York to meet Downing, and if possible arrange for the payment of the drafts. The indebtedness is thought to be about \$150,000. The mill property at Litchfield cost \$400,000, and has a bonded debt of \$225,000. Wing's troubles are said to have grown out of an attempt to do a very large business on inadequate capital. He has also been engaged in the construction of a railroad between Litchfield and East St. Louis, which is said to have crippled him greatly.

St. Louis, June 21.—Additional information regarding the embarrassment of D. L. Wing & Co., the Litchfield, Ill., millers, is that Wing's drafts on Downing were drawn through the Laclede and Boatmen's banks of this city, the officers of which say they are secured. The indebtedness of the concern, as near as can now be ascertained, is: D. L. Wing, about \$25,000; Downing's acceptances, about \$100,000; bonded debt on mill, \$225,000. The assets, outside the mill property, cannot be ascertained. The chief question seems to be whether Downing can protect his acceptances, and this is what Wing has gone East to find out. The mill has been leased for a year to parties here, and will be continued in operation. This action was taken to prevent small creditors from attaching the property.

Catalogues and Price Lists Received.

"A Little Talk on a Big Subject," a condensation of interesting facts relative to the Bodine patent roofing. Bodine Roofing Co., Mansfield, O.

The Rounds sectional roller mill, manufactured by the Jno. T. Noye Mfg. Co., Buffalo, N. Y., possesses sufficient points for an illustrated descriptive pamphlet.

Burnham Bros., York, Pa., descriptive of the celebrated Burnham turbine. Splendidly illustrated, and replete with valuable tables and information respecting turbines.

The "Deluge" steam pump, extensively used in Indiana manufactories, and of good reputation in many other states, has its merits set forth in a neat catalogue and price list sent out by its manufacturer, Jasper N. Hill, of Anderson, Ind.

The Heald & Morris engine catalogue shows illustrations and descriptions of the various styles of engines built by this well-known firm, also their centrifugal pumps. Some very good reading, and will repay sending for. Address Baldwinsville, N. Y.

An interesting little treatise on the Thayer system of milling with buhrs and buhrs and rolls combined. Good reading. It will cost the miller but the postage to secure it. Address the Thayer Mfg. & Mill Furnishing Co., Westerville, O.

A book of 124 pages from the Central Iron Works, St. Louis, Mo., otherwise Geo. J. Fritz, manufacturer of steam engines, and the renowned patent Beam Doctor for feeding steam boilers. A valuable compendium of information of steam appliances. Will be sent gratis.

The Flenniken Turbine Co., Dubuque, Iowa, send a very interesting pamphlet which sets forth the meritorious features of their wheel, and at the same time furnishes some spicy reading in the way of dialogue and scrap-book material. A valuable reference book, and all it costs is the writing for it.

A many-colored, richly printed circular from the big engine builders, the Westinghouse Machine Co., Pittsburgh, Pa., sets forth in terse terms the uses to which their engines are adapted. Matter of special interest to steam-using millers. Also supplementary pamphlets for each style of engine made by them.

Low Grade.

Perhaps under no one term is concealed so much false logic as is covered by the term "low grade." While it is true that the less low grade made in the mill, the better the mill's books will show, it by no means follows that the amount of the article made is an index either of the character of the milling or the profits of the mill. A good mill may make twice as much low grade as a poor mill makes, and this may arise solely because it makes a closer finish and keeps the impurities out of the higher grades. A mill that is not doing either close or good work may have only a small percentage of dark flour which it can spout into its other grades. But the low grade is there, all the same; that is, what is not in the feed pile. Fifteen per cent. of low grade, or more, need appeal no one. A part of that amount may be an absolute saving over the price of feed, and a goodly portion of the remainder may profitably be kept out of the other grades. At the same time it should be the aim to keep the quantity of low grade as small as possible, provided, of course, that this is not done at a sacrifice of a close finish, or deterioration of the baker's flour. This simply means keeping the impurities out of the flour, and using such machinery as will not make and incorporate them in the flour. At the present stage of the art of milling it is impossible to avoid making more or less of a grade of flour with which impuri-

ties are largely mingled. But at the same time must be remembered that "low grade" is a relative rather than an absolute term, and the amount made is only a criterion of comparison when the price obtained for the entire product of one mill shows that it is getting less money from its wheat than other mills. We are glad to see that comparison of different mills and systems are now being made on the basis of the mill's entire output; and when it is a safe general rule to make the largest possible amount of the best flour compatible with a close finish in the last analysis, the question is almost wholly one of the gross price obtained for the product.—*American Miller.*

The Coming Harvest.

Mr. S. M. Talmage, of Milwaukee, has issued his annual estimate of the spring and winter wheat crops, basing his estimates upon the reports just received from the secretaries of the state boards of agriculture and the statistical agents of the states named. His estimates on spring wheat are:

States.	Bushels
Minnesota.....	38,000,000
Nebraska.....	31,000,000
Iowa.....	28,000,000
Dakota.....	23,000,000
Wisconsin.....	21,000,000
Total.....	141,000,000

His estimates on winter wheat are:

States.	Bushels
California.....	46,500,000
Kansas.....	34,500,000
Indiana.....	33,500,000
Missouri.....	32,500,000
Ohio.....	30,500,000
Illinois.....	30,500,000
Michigan.....	30,000,000
Pennsylvania.....	23,000,000
Oregon.....	16,000,000
New York.....	14,000,000
Kentucky.....	13,000,000
Maryland.....	10,000,000
Tennessee.....	10,000,000
Virginia.....	7,000,000
North Carolina.....	7,000,000
Texas.....	5,000,000
West Virginia.....	5,000,000
Georgia.....	4,000,000
Washington Territory.....	4,000,000
Colorado.....	3,000,000
South Carolina.....	2,500,000
New Jersey.....	2,500,000
Arkansas.....	2,000,000
Alabama.....	2,000,000
Utah.....	2,000,000
Delaware.....	1,000,000
New Mexico.....	1,000,000
Montana.....	1,000,000
Idaho.....	1,000,000
Maine.....	500,000
Arizona.....	500,000
Mississippi.....	500,000
Vermont.....	500,000
New Hampshire.....	200,000
Nevada.....	200,000
Wyoming.....	200,000
Connecticut.....	48,000
Massachusetts.....	25,000
Louisiana.....	25,000
Florida.....	10,000
Rhode Island.....	10,000
Total.....	375,000,000

Postponed.

To the Editor of The Millstone.

SIR: The annual meeting of the Millers' National Association which was to convene at Chicago, June, is by order of the president and sub-executive committee postponed to December next.

S. H. SEAMANS, Sec'y
MILWAUKEE, Wis., May 28, 1884.

Geo. Bain and Alex. Smith have been making interesting for the White Line Transit Co., in St. Louis courts, on some question between themselves and the company. It seems from the report we have of the suit that George and Alec have the company like the Scotchman's dog had the hare.

Chas. B. Hall, a prominent citizen of Marion, O., and part owner of the Phoenix mills, died 21st inst., aged 62 years.

Mr. Alderman Hadley, the first president of National Association of British and Irish Millers has failed.

The premium list of the Indiana State Fair 1884 is out. The date of the fair is Sept. 29 to Oct.

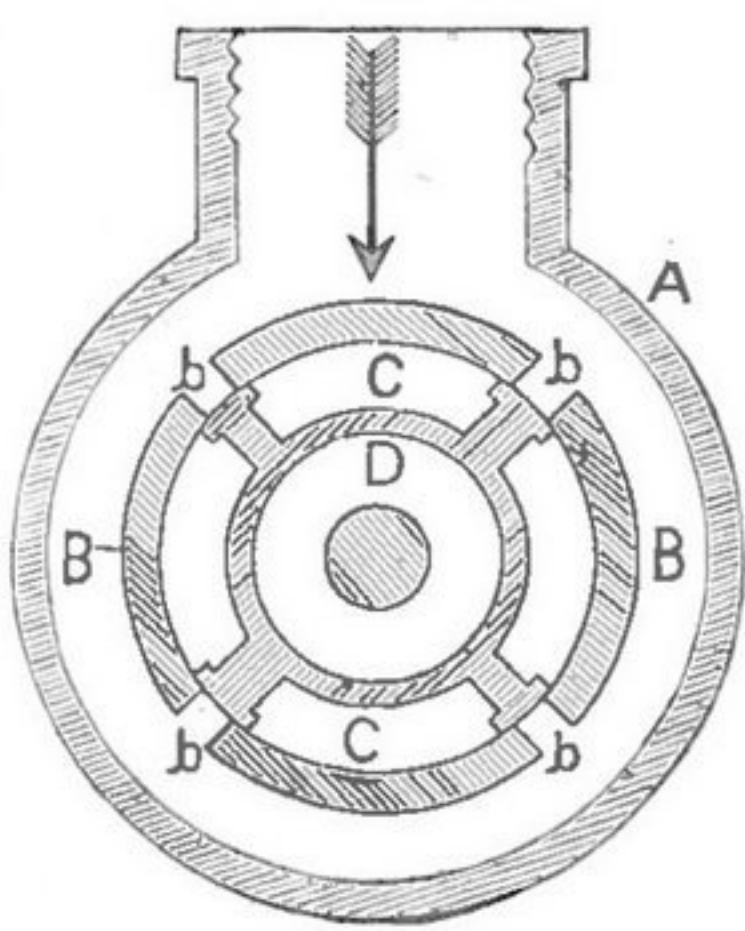
WRIGHT'S STEAM ENGINE GOVERNOR

THE accompanying illustrations are of the steam engine governor, manufactured by Wright Machine Company, of Worcester, Mass. It is driven by a pulley *R* attached to the revolving ball standard *W*. This standard has two slotted arms *X X* in which the ball arms are pivoted, and which also support the cross-bar; the cross-bar is a support for the flat bow springs *S S*, which control the action of the balls by pressing them inward, their tension being regulated by the adjusting screw *U*, which presses the plate *T* upon them, and so varies their pressure upon the arms at the points *P P*, giving a wide range of adjustment without lessening the full volume of steam when the full power of the engine is required. As the weight of the balls is not depended on as in most governors, light balls are used, running at a high speed, making it very sensitive and enabling it to run in a horizontal position, thus avoiding the use of a driving shaft and gears and making it very compact as well as noiseless. In the forked ends *Y Y* of the ball levers are loosely pivoted blocks, which revolve in a groove in the head *N*, fastened to the rod *M*. As the balls are forced outward and inward the rod *M* is moved downward and upward, closing or opening the valve by means of the lever *H* which is attached to the valve stem.

The valve stem is slightly tapered, and fits a correspondingly tapered seat in the screw *F*. The pressure of the steam causes its upper end to press upon the screw *K*, by which it is so nicely adjusted to its seat as to prevent both friction and the escape of steam, making a steam tight joint without packing. The annoyance of frequent packing is thus avoided. After the screw is once properly set, it will need no further attention. This arrangement of the valve stem, together with the quick speed of the balls and their great freedom of action consequent upon the arrangement of the springs, and their action upon the valve through the lever *H*, makes the governor very sensitive to slight variations of speed.

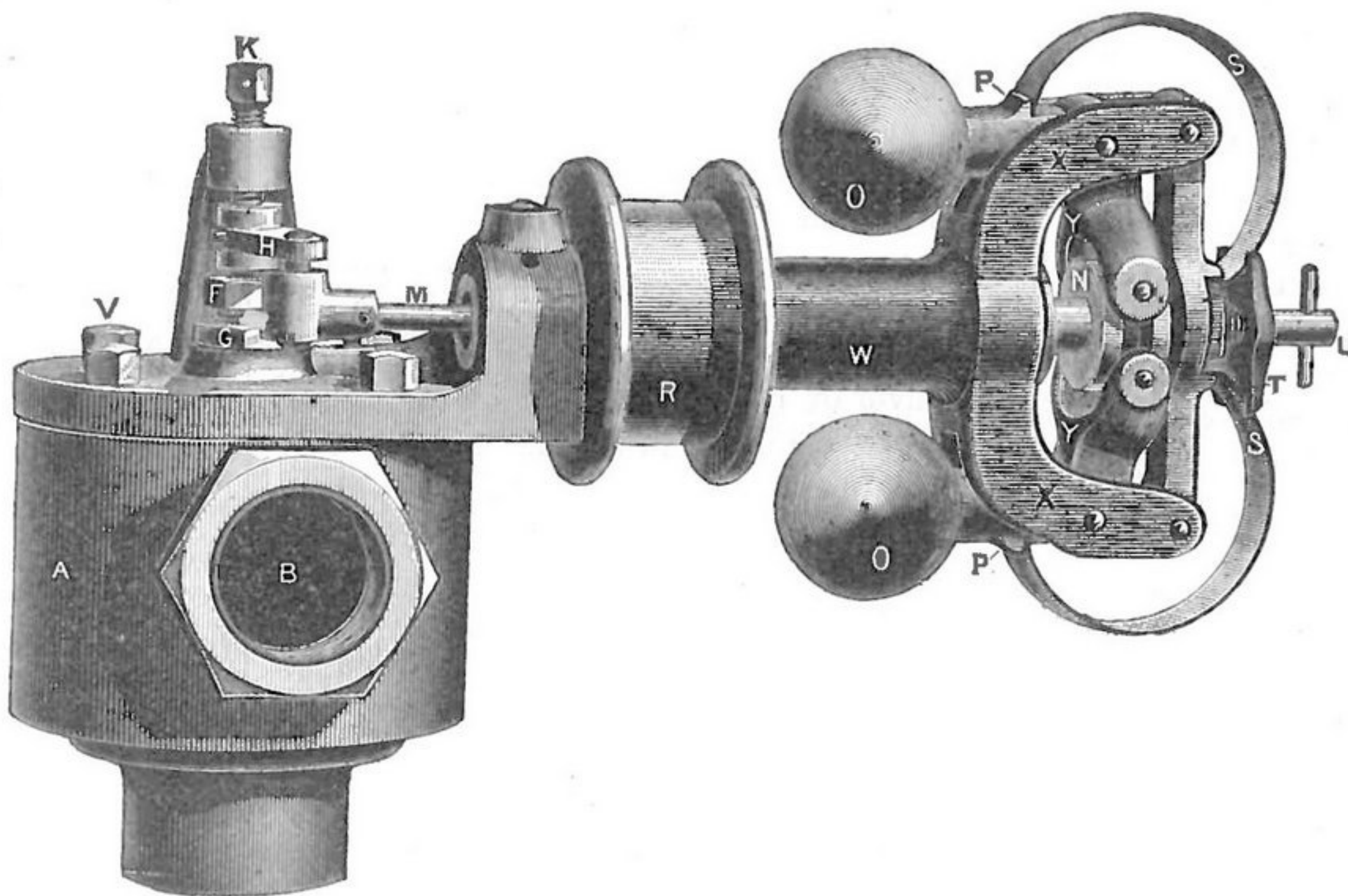
The Decline of Britain.

Of the 57,000,000 million acres over which the surface of Great Britain extends, the area under tillage of wheat has diminished from 6-12 to 4-12 per cent. of the whole from 1874 to 1883, while the population has increased in that time by three and a half millions. More than one and a half as many people are now in England to each acre of wheat as there was ten years ago. In 1874, Great Britain showed nearer to seven than eight persons to each acre of wheat; in 1873 there were nearly twelve inhabitants to each acre of wheat. The wheat export from America is the chief cause of this difference.—*American Mail and Export Journal*.

**Steam Engine Economy.**

Probably no other condition is so destructive to good economy as an engine too large for the work to be performed, as with the comparatively light load which is consequently placed upon it, internal condensation is favored to a great extent. Owing to

the early point of cut off, the expansion and consequent fall of temperature are excessive and, it admits of no denial that the immediate surfaces of the cylinder share in this fall of temperature, which still further continues during the exhaust, and it has been shown that deposits of water like dew frequently take place on them. All these surfaces must be reheated and all the water formed evaporated at the expense of the next admission of steam, which, being necessarily small on account of the light load, suffers severely from condensation. With a heavier load the expansion and cooling are much less, and the amount of steam admitted to restore the heat is much larger, and as a natural consequence, the results obtained are much more sat-



isfactory. Overloading, however, is not to be recommended, and our remarks are only intended to correct the popular error arising from the impression that economy increased definitely with increase of expansion—that an engine too large for its work is not necessarily wasteful. In non-condensing engines, moreover, a direct loss occurs by expansion below the atmospheric line, thus creating a vacuum on the impelling side of the piston at the expense of the fly wheel.

It may not be out of place in this connection to say a word or two on the piston speed of engines. As a factor of economy, piston speed of itself has no value, and that which must be considered as important is piston speed obtained by rotative speed. It will readily be seen that piston speed alone could be obtained by increasing the length of stroke of the engine without increasing the number of revolutions, but such a proceeding would diminish rather than improve the economy, owing to the fact that the longer time steam remains in contact with a cooler surface the more will it be condensed. To use a small quantity of steam at a time, to use it very quickly, and to keep it hot, are the fundamental principles of high rotative speeds. The fluctuation of temperature of the interior cylinder surfaces with each stroke has already been noted above. With a slow motion the cooling expansion penetrates further into the metal of the cylinder, causing considerable condensation at each admission of steam. Constructive considerations alone put a limit to rotative speeds, and as our knowledge in this direction will increase higher speeds will, without doubt, be adopted. The many advantages of such high speeds, disregarding for the time the greater economy in steam, are apparent, especially in mills, doing away with expensive trains of intermediate gear, of whatever nature, which are otherwise necessary to multiply the usual speed of the prime mover up to that now almost universal in mill shafting.

In this respect it is but a repetition of the transition in hydraulics which gradually wiped out the ponderous overshot and breast wheels, and replaced them by high speed turbines, and analogy will permit us to expect a revolution equally radical and successful in the near future of the steam engine.—*Hald & Morris' Catalogue*.

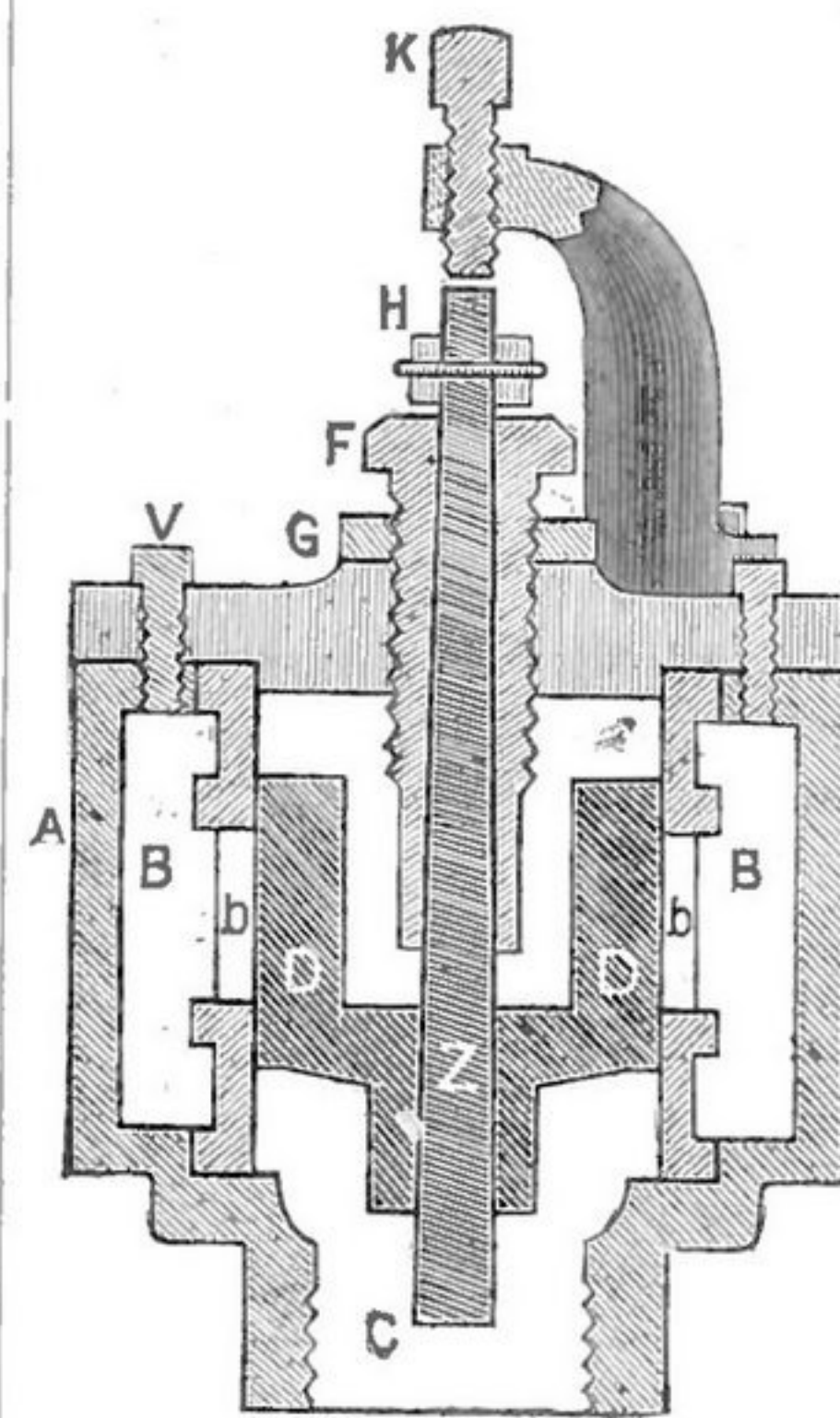


A fire-proof ceiling has been invented. It is composed of tiles supported from joists by hangers, and hanging-facing tiles placed against the sides of the joists and top tiles placed between the upper parts of the joists. The top tiles and tops of the joists are covered with a layer of cement, rendering the ceiling secure against fire.

A French inventor, who has patented a machine for the use of concentrated solar rays as a general motive power, has set up three of his machines in Algeria for the French government. He is now carrying on experiments at the Island of Porquerolles, near Hyeres, in France, where he is threshing Indian corn and raising water by the action of the sun's rays.

There is an invention spoken of which, it is thought, will abolish the bit. It is called the carrago, or anti-horse torture. It is composed of a steel band placed over the front bone of the horse's nose, and to this appliance the reins are attached. The inventor claims for this substitute for the bit that it gives complete control to the driver over the horse without inflicting the least discomfort or torture on the animal itself. It has been tried with satisfactory results.

An inventor in Scotland has an apparatus for welding the seams of steam boilers. For this purpose he employs a modification and extension of the roller flue-welding machine, well known in the United States, and extensively used in railroad shops. The device consists of a hydraulic cylinder and ram, the ram being fitted with



two rollers—one to roll along and operate with welding pressure on the joint, and the other to roll along the opposite part of the shell in combination with external blocks, which confine the shell and prevent enlargement during the operation.

The latest invention in the way of office furniture is a stamp with a clock attachment, the hour hand of which is simply a raised point upon a moving circle. The minute hand is an arrow on another revolving circle. An inked tape passes over these indicators and the outer circle of the hour figures. Beside the clock face is a cylinder with several faces, each bearing a word, such as "approved," "wired," "delivered," "answered," etc. Thus when a business man sends a letter, telegram, or receives an order, or transacts any business, he can by the use of this stamp record the precise moment at which the thing was done.

GRAHAM AND WHITE FLOUR.

It is doubtless well known to most people that the manufacture of flour has undergone a complete revolution within ten years. To-day, instead of the old millstone, rollers made of steel or chilled iron are used, and the wheat is reduced to flour by several successive breaks. By this method nothing goes into the flour-barrel but pure flour.

Those who recommend Graham flour do so under a mistaken notion that there is some nutriment in the bran. There is no more nutriment in it than in a piece of flint, as it is nothing but pure silice. It is absurd to call whole meal Graham flour, and the gentleman after whom it was called did not recommend its use as food except in certain cases. On page 55 of Dr. Graham's book he says:

"Coarse wheaten bread may do very well for those who are troubled with constipation by mechanically irritating and exciting the stomach and bowels. Yet, for that reason, it is wholly unfit and improper for those who are afflicted with chronic diarrhea. Another objection is that, although bran may serve, like other mechanical excitants, for awhile to relieve constipation, yet it soon wears out the excitability of the organs and leaves them more inactive than before."

What do Graham's disciples say to this?

Several other passages of Dr. Graham's works could be quoted to show that whole-wheat flour is not only unhealthful as an everyday food, but that in a short time it destroys the coating of the stomach.

Let us see what science teaches about Graham flour. Take a grain of wheat, view it through a microscope, and what do you see? A rough, bristling structure as shaggy as the bark of an old oak, much dust and dirt, many insects' eggs stored away in the crevices, and shaggy hairs on one end that hold in their embrace any quantity of dirt. You feel certain that these substances could not be designed for human food and you know that they are not food. Chemistry indicates nothing nutritive in these shells, and even the flavor of the grain is absent. You put some of the bran in your mouth, and the particles of glass—for that is what they are—burrow into the membranes, and irritate and inflame them so much that you are convinced they are not good for food. If every atom of inert matter could be eliminated from substances swallowed, indigestion would be unknown, the great object in eating being to take food and nothing else. Harsh substances cannot be mixed with food without a serious loss of the food portion which passes through the alimentary canal unassimilated by reason of its base association.

Exhaustive tests have proved that not less than one-half of the real food contained in Graham meal passes unchanged. The bran is wonderfully potent as an irritant, and its action in the stomach is that of a cathartic. Catharsis is depletion; and habitual depletion should, of course, be avoided. It will always be induced by substances which cannot be emulsified, and without emulsification assimilation is impossible. The habitual employment of substances which cannot be reduced to a pulp is to lessen stomachic and intestinal energy, and as no human stomach can emulsify wheat-hulls or bran, it follows that they should not be sent there. They could not be boiled to a pulp in water in a century, and can only be dissolved by a caustic alkali or mineral acid.

Examine the substance voided from cattle that have swallowed these hulls. They will be found unchanged. Their needle-like points are not even blunted. Nor are their serrated edges dulled. This is why they are removed from the flour. The

same reason induces us to remove the skin from the banana and the potato or apple. They have no value or solubility. Let the dyspeptic give up his pills and his bran food and take healthy food and exercise and he will soon recover. When a person commences on a bran food, a little is sufficient; but after a time the dose must be increased, making the drain on the system enormous. The fluid poured into the alimentary canal to protect it against the blistering effect of the scratching power of the irritant must inevitably sap the vital powers. Besides this, the important part of the digestive process performed in the stomach is not perfect in consequence of the excess of harsh material. The sensitive stomach declines to contract upon and agitate a mass of food which bristles with thorny points. It may attempt it, but it will no more continue to discharge that important function with energy than one would consent to close his hand a second time upon a cushion of concealed needles.

Another reason why bran is not healthy is because it contains cerealine; which was discovered by M. Mège Mouries, by whom it was shown that the good or bad color, the fineness of texture, or even the flavor of bread depended on the absence or presence of cerealine in the flour. The most noxious cerealine is contained in the cells of the innermost membrane of the bran, and its dark or black character is rendered apparent by mixing bran with flour. The result in baking is not what might be expected, white bread with flakes of bran in it, but a distinctly brown loaf. The best, the whitest, and most nutritious flour contains no cerealine, and consequently no bran.

What Dr. Graham meant was, as it was almost impossible to retain all the mineral vital elements and phosphates in the flour by modes of milling in vogue in his time, that it would be better to use the meal with the bran in it than lose the phosphates. But there have been great strides in both milling and chemistry since his day, and it is known beyond any doubt that what is gained by having all the phosphates introduced with the bran is trebly lost in consequence of the positive disadvantage of the bran not allowing the food to remain long enough in the stomach for its nourishing properties to be duly absorbed and assimilated.

—J. D. Nolan, in the N. Y. Sun.

Flour Mill Insurance.

The following circular emanating from the general agency of the London Assurance Corporation, has been addressed to insurance agents throughout the country. We give it as wide publicity as possible feeling that it is a matter for millers to at once consider, reminding them at the same time that the various millers' mutual companies are refuges to which the millers may flee if they consider the stock companies rates too burdensome:

To Agents:

You are no doubt aware that the past ten or fifteen years have witnessed the introduction of important changes in the process of converting wheat into flour. You may not be fully aware that these changes, in connection with other causes, have operated disastrously to underwriters with respect to the ratio of losses incident to the flouring mill hazard. This class of risks—always precarious as to profit—has become increasingly so by reason of the constant remodeling of mills previously constructed, the depreciation growing out of obsolete methods, and the many new devices employed (often experimental in their character) for securing the largest attainable amount and the finest attainable quality of flour from a given quantity of grain.

The constant yield of losses as the result of these influences, and the changed character of the hazard, has determined not a few underwriting institutions to abandon the writing of flouring mills altogether; with others, the effect has been to stimulate a desire for the application of different and more intelligent methods in adjusting the rate to the hazard than have been heretofore employed.

With this object in view, the accompanying schedule—prepared by a committee of practical underwriters, as the result of a good deal of labor and wide correspondence—has been approved and adopted by a large number of the leading agency fire insurance companies, and will become operative on the first day of August next. The ends sought to be accomplished by this schedule are two-fold: First, to secure a moderate advance only in the average rate; second, and more especially, to secure an improvement in the class

of risks with respect to the fire hazard. Its application mills of the latest and most approved construction will affect current rates but slightly, and in many cases not at all. With less modern mills the advance in rates will be more manifest, but a material part of such advance may be avoided in most cases by mill owners making changes that can be effected at a comparatively trifling cost. The co-operation of yourself and all members of our profession is desired in securing recognition on the part of mill owners of the absolute necessity of efforts to improve the character of their risks, as well as in convincing them that underwriters feel compelled to adopt more discriminating rates and methods, in order to lessen the hazards that have brought these risks into such disfavor, and to prevent widespread determination to abandon them as wholly unprofitable.

The date fixed for making this schedule the standard ratings has been put sufficiently far enough ahead, so that risks to be written in the autumn can be changed to meet the requirements of the schedule, and that none shall have just ground for claiming that proper notice of these contemplated requirements was withheld. You will render valuable service by disseminating among mill owners information conveyed by this circular and the accompanying schedule, and where new mills are contemplated, or in process of construction, by showing the builders that they can secure important advantages in the matter of rates by conforming to the standard hereby provided.

Yours very truly, BROOKS & MANNING.
CLEVELAND, May 29, 1884. *General Agent*

FLOUR MILL TARIFF.

A standard mill is described substantially as follows: Brick or stone, gravel, metal or slate roof; power, water or steam, daily capacity of twenty-four hours not to exceed 200 barrels; no cleaning machinery in mill, no corn sheller, grain dryer, closed lights, force pump and stand pipe, hose attached, on each floor, barrels of salted water buckets in each on every floor and attic, save grinding in water power mills.

Basis rate, \$3.00.

Add for steam power in brick or stone boiler house, metal, slate or gravel roof, with brick stack, boiler house cut off from mill (except shaft hole) by iron door, or iron door, metal covered upon both sides, 50c.

Add for the absence of an iron door or wood door, not covered on both sides, 15c.

Add for shingle roof on brick or stone boiler house, with stack is brick, 10c.

Add for boiler in mill building, \$1.

Add for brick-lined boiler house, with iron door to mill wood door, metal covered on both sides, 75c.

Add for frame boiler house, or brick-lined boiler house not cut off, metal stack, \$1.

Add for same with metal stack, brick base, or brick stack, 75c.

Add for iron stack through metal, slate or gravel roof boiler house of a frame mill building, 50c.

Add for iron stack through metal, slate or gravel roof boiler house when mill is brick or stone, 25c.

Add for iron stack through shingle roof of boiler house, 25c.

Add for frame mill building, steam power, \$1; power, 25c.

[Note.—The charge of \$1 for frame building does not include the charge for shingle roof on steam power mill.

Add for brick veneered or iron clad mill building, 75c.

Add for shingle roof on steam power mill, 50c.

Add for no force pump and stand pipe and hose, 50c.

Add for absence of either one, 25c.

[Note.—If force pump and stand pipe are operated dependent power outside of mill, 25 cents deducted above.]

Add for no barrels and buckets on every floor, 25c.

(Grinding floors may be excepted in water power mills.)

Note.—Fire extinguishers on every floor when re-checked every two months shall be accepted as a substitute for the absence of barrels and buckets on every floor.)

Add for cleaning machinery in mill, 25c.

[Note.—Meaning machinery for cleaning and screening grain, including smut mill.]

Add for corn sheller, 25c.

Add for grain dryer at option.

Add for dust room or house in mill with outside ventilation, 25c.

Add for dust room or house in mill not ventilated side vents, 50c.

Open lights prohibited in the mill.

The above rates include all mills having a capacity of 200 barrels and under per 24 hours. Mills having a capacity:

Add for over 200 barrels up to 300 barrels, 20c.

Add for over 300 barrels up to 400 barrels, 30c.

Add for over 400 barrels up to 500 barrels, 40c.

Add for each 100 barrels or fraction thereof, up to 500 barrels, in addition to the 40 cents last named, 5c.

Add for above 2,000 barrels, 2½ cents per hundred barrels.

Where steam is sometimes used as an auxiliary write it as a water mill charging the rate as per schedule stipulating in policy that if steam is used for power mission must be obtained and indorsed on the Charge for this, short rates of the additional annual for steam power.

Where steam power is set up in a building that is (or less) away, if frame, and 25 feet (or less) away or stone, and power is conveyed by shaft or cable, extra charge shall be made therefor, in lieu of schedule charge above. Where distance however is less than in any case, schedule charges shall apply.

Exposures to be charged for.

Where automatic sprinklers are used (each fire protected) a deduction of 25 cents may be made.

An Experiment in Steam Plowing

Took place near Fargo, Dak., recently. A steam engine drew eight plows, turning a 12 inches thick as well as could be done by horse power, at the rate of over twenty-five acres a day. This will mark a new era in wheat growing as it will enable farmers to plow at a cost of more than \$1 an acre.

A BOQUET OF BLOSSOMS.

June.

Sweet June, O, rarely scented June,
Thy blushing face is here;
And were it e'er our own to choose,
We'd have thee all the year.

There is no month whose laughter fills
The air so full of tune;
There is no loveliness like thine,
O, proud, triumphal June.

And yet we have more brilliant hues,
When 'neath a hotter sun;
Is there a secret why this month
Should be the sweetest one?

Have we not known the richest gifts
May bring far less content,
Than those that first in early days
Of joyous youth were sent?

We join June's name with roses glad,
The rose of crimson bloom;
And roses are emblems of hope,
And never of the tomb.

Then, June, it is because thy smile
So gracious and so kind,
Hath woke the first sweet summer song,
And sung it in the wind.

Come now, in all thy harmony,
And victory, come soon;
And let us breathe in ecstasy
Thy breath, bewild'ring June. —*Ida May Davis.*

Glug, Glug, Glug.

"All nature smiles," the poet cries,
The tree laughs in its leaves,
And even man, with twinkling eyes,
In quiet fun believes.

For, when at home, connubial war
His peace and comfort riles,
He slips behind the nearest door
And softly, sweetly "smiles."
Then as he tilts the jolly jug
It chuckles gaily, "Glug, glug, glug."

—*New Haven News.*

Sad Case of Melancholy.

The Mugwump roosts on the hollow log,
The Sagwop sits in the tree;
Whenever I hear the Hogwip sing,
My heart is sad in me.

Whenever the Snagpap toots his toot
To the wail of the Nipwhap hen,
And the Migfunk chirps in the stilly night,
You bet I am lonely then. —*Toronto World.*

Merry Days.

Soon will the merry picnic days
In season roll around,
When, to escape the sun's fierce rays,
We'll seek the shaded ground,
Where ants have a peculiar knack
Of wandering from their bed
And marching up a fellow's back
With a slow and measured tread.

—*Bismarck Tribune.*

"Ha! ha!" saith the carpet tack, "Ha! ha!"
Now comes the time of my *coup d'etat*,
When the hammer's gripped by the gruesome pa,
And strikes with the stroke of a tyrant shah.
But his thumb intrudes and he bleats a "baa!"
And shrieks for the reinforcing ma,
Who takes a hand in the tack-ticks ah,
And skips the job at the old *faux-pas*!
"Ha! ha!" saith the carpet tack, "Ha! ha!"

"Ho! ho!" saith the elbow joint, "Ho! ho!"
'Tis the vernal notch for my crude tableau,
When the host removeth the stove, you know,
And I cling thereto with a lover's glow,
And I give him many an overthrow,
And soot the same with a film of woe.
Till he utters many a rare *bon-mot*,
While grins his wife at the festive show,
And he waltzes off on a mangled toe,
To the junk department down below;
"Ho! ho!" saith the elbow joint, "Ho! ho!"

—*Yonkers Gazette.*

Pass the butter gently, Mabel,
Shove it lightly through the air;
In the corner of the dish, love,
You will find a nut-brown hair.
What fond memories it awakens
Of the days ere we were wed,
When upon my fine coat collar
Oft was laid your little head.
Lovingly I stroke those tresses,
In the happy days gone by;
Now I strike them every meal time
In the butter or the pie!

—[From "Sliding on to Glory; or the Snag I Ran Against," by "Liberty" Hall.]

Scratch and Think.

If a
penful
of ink
will write
a pun how
many puns can
you write with a
bottle of ink? It
makes an 'old man
scratch and think.

—*Quincy Smile.*

An Idyl of Hate.

"That horrid Mrs. Sawyer!" said Mrs. Jones, the other day. "I wish she would move out of the neighborhood."

"Well, what do you run there all the time for? I told you how it would be," retorted Mr. Jones.

This was not the kind of sympathy Mrs. Jones expected, and she became ominously silent.

"What has she said about you now," inquired Jones.

"Oh, it's nothing about me," said Mrs. Jones indifferently.

"Who is it about?" asked Jones with evident anxiety.

"It's about you," resumed Mrs. J. "She says you're no more fit to run for office than a brindle cat, and that if Sawyer votes for you she'd never speak to him again; she says—"

"Never mind," said Jones loftily. "I'm not the least interested in anything a feeble-minded, gossip woman says."

But the flatiron had struck home, and Jones left the table with a look on his face that boded no good. It was baking day at Sawyers'.

If there was anything Mrs. Sawyer prided herself upon it was the tender, flaky quality of her paste. Jones knew this.

Mrs. Sawyer was just rolling that tender pie-paste into great sheets of transparent dough, when there came a knock at the door. Mrs. Sawyer answered it, rolling-pin in hand. It was Willie Jones who had knocked.

"Please, Mrs. Sawyer," said the innocent child, "pa would like a piece of your pie-crust."

"Certainly, Willie," said Mrs. Sawyer, much flattered, "but it isn't baked yet."

"He doesn't want it baked"

"But he can't eat raw pie-crust."

"He isn't going to eat it."

"Then what is he going to do with it?"

"He said he wanted to mend the harness, and make hinges for the barn door with it, and—"

The rolling-pin hung fire, and the boy escaped, but the barrier between the houses of Jones and Sawyer can never be broken. It is tougher than the pie-crust. —*Detroit Free Press.*

De Belle ob Dat Funeral.

"Ise gwine to leave you all to-morrow," said a brawny colored cook to a lady who presides over a West End mansion, a few days ago. The lady was naturally surprised, and remarked, "Why, Dinah, what is the meaning of this? We are all pleased with you and your cooking."

"Ise gwine to get married."

"Why, you startle me. I never noticed any of your gentleman friends coming here, and you very rarely go out."

"Don't you know that I went to a funeral last Sunday?"

"Yes; but what has that to do with your marrying?"

"Ise gwine to marry the husband of the corpse!"

"But the wife died only a week ago."

"Dat's so; but makes no difference."

"Did he propose to you at the grave?"

"No, not 'zactly, but I was de belle ob de funeral, I knows dat."

Dinah has since wedded the heart-broken widower. —*National Republican.*

Tommy Tripp's composition: "Wun time a frog and a hop-tode they met, and the frog sassed the hop-tode 'coz it was clumsy, but the tode it said, 'if you come here on this flat stone where we can start even, I'll beat you jumpin' hi, best two out o' three.' So they done it, and the first time the tode it only jest cleared the stone, but the frog it went up so hi, that it hurt itself cummin down, and cudn't jump no more at all, and the hop-tode beat it the other two times." —*Erratic Enrique.*



A Zulu belle is like the proverbial prophet. She has not much on'er in her own country.

The reason why Richard III., when waking from a troubled dream, called for another horse, was because he disliked the nightmare which he had so recently ridden.

"I'd like to have you give me a good send-off," said a man to the editor the other day. "Well, as soon as my boots come back from the cobbler's I'll do it," was the effective reply.

A small boy who stood gazing wistfully at a large candy man in a city confectioner's window, suddenly exclaimed: "I could lick that fellow with both my hands tied behind my back!"

"What is home without a haunt?" as the ghost said. "What ghost, foolish one." "Why, Naomi, of course." "She wasn't no ghost." "That's all you read your Bible for. Didn't Ruth say to her, 'Whither, thou ghost?'"

Miss Ella Wheeler in her maiden days having naively sung:

"I will love the man whom my soul reveres,
And kiss him blue with a fiery yearn—"

the Albany Times somewhat pertinently observes that by this time the happy Mr. Wilcox is no doubt yelling for help.

"What is a pharmaceutical association?" asked a little damsel who had carefully spelled out the long name in the paper, and the old gentleman, aroused from a perusal of the stock list, answered: "Farmer's cuticle association? Some of those fellows that go around skinning farmers, I suppose."

"Father," remarked a promising youth to an Ohio stock raiser, "I guess you are going to have opposition pretty soon." "Eh," returned the old gentleman with a look of alarm. "Farmer Hayes is going into the sheep business." "Who told you so?" "Nobody. I heard him talking to a friend this morning about introducing hydraulic rams on the farm." —*Brooklyn Eagle.*

It fell to the lot of an inebriated person to be tarred and feathered by his boon companions. He was prepared to view any freak of fortune with equanimity, and after some hours he was observed to rise and survey himself in the pier-glass. Did he shriek with horror? Oh, dear, no! He simply observed with complacent resignation: "Become a bird, by Jove?" and then lapsed once more into slumber.

Doctor—"No, my dear sir, we must keep ourselves quiet for the present. No stimulants—nothing more exciting than gruel. Gruel for breakfast, gruel for luncheon, gruel for dinner, gruel for—" Peter Pundoleful (a noted burlesque writer—though you wouldn't have thought it to look at him—rousing himself suddenly)—Ah! my dear doctor, why is there not a society for the prevention of cruelty to animals?" —*London Punch.*

The Hon. John L. Sullivan, of Boston has a new baby, which he is very proud of.

At times he finds it necessary to administer to it corporal punishment, and it was on one of these occasions recently, that Mrs. Sullivan interrupted the proceeding with the cry of "foul."

"Wot's the matter wid yez?" demanded the Hon. John, looking up at his wife.

"You are striking the child below the belt." —*Philadelphia Call.*



WANT MILLS.

The citizens of O'Neill, Nebr., on the Elkhorn river, are offering inducements to the right man to build a flouring mill at that point. One individual will subscribe stock to the amount of \$5,000 toward the enterprise, while others agree to help the scheme quite liberally. A good man will find this a grand opportunity, and we advise such a one to investigate it. The Elkhorn furnishes sufficient water power, and O'Neill is in the heart of a great wheat country, with no mill in the vicinity, plenty of brick and building material.

Yakima, Washington Territory, offers a good opening for a mill. Flour is hauled fifty miles, and wheat is a drug in the market.

Nebraska City, Nebr., would be a good point for some practical man to erect a No. 1 mill. The town is poorly supplied in this respect, and being situated in the very best agricultural part of the state, needs a good mill.

A good steam flour and grist mill is wanted at Jacksboro, Tex. Robinson & West, of that place, will give all information.

Mentone, Ind., wants a flouring mill.

A grist mill is needed at Black River Station, Mich.

Hastings, Mich., is said to afford a good opening for a flour mill, the old one being burned some months since.

A 50-barrel roller mill is wanted at Gladstone, Manitoba.

Citizens of Westbourne, Manitoba, offer a bonus for a grist mill.

NEW MILLS.

A flouring mill is being built at Alderson, W. Va. Citizens of Hamilton, Dak. have subscribed \$12,000 for a flouring mill.

Alexander Mason, of St. Louis, Mo., intends putting up a \$30,000 mill at Dallas, Tex.

P. U. Clinghouse is about to build a mill at Lonoke, Ark.

Mandan, Dak. is likely to have a 200-barrel roller mill this summer.

The Elkin Mfg. Co., of Elkin, N. C., are building a new flouring and corn mill.

P. L. Terry & Co., of Roanoke, Va., are building a roller process flour mill with a capacity of 125 barrels per day.

A 100-barrel roller mill is being built at Simpsonville, Ky., to replace that of McDowell & Basye, burned sometime ago.

A flour mill is soon to be erected at Sargent, Dak.

Grandin, Dak., is to have a 200-barrel mill this season.

The Taylor-Hitz Company is a new corporation with a capital stock of \$50,000, which will rebuild the Columbia mills, at Madison, Ind., in an enlarged form.

Todd & Hosford, of Eugene, Vermillion county, Ind., whose mill was burned Dec. 26, 1883, are about to rebuild on the roller system, and contemplate building a mill of 75 barrels capacity.

Fort Davis, Tex., is to have a flour mill.

A. S. Hall is building a flour mill near Salisbury, N. C.

W. D. Fewell, Rock Hill, N. C., is building a flour mill.

Goold Bros., of Windsor, Ill., have nearly concluded the arrangements preparatory to building a roller mill at Howard, Dak., with a capacity of 75 to 100 barrels. The place gives a bonus of \$2,000 toward the enterprise.

PROPRIETORSHIP.

The Odessa Milling Co. have sold their mill at Odessa, Mo.

A. F. Brown, of Melrose, O., has sold his mill to Jos. Wollam.

The Pleasant Hill Milling Co., of Pleasant Hill, Mo., has been incorporated with a capital of \$20,000.

The milling firm of Peebles, Foulds & Co., of

Cincinnati, O., has dissolved. Mr. Fould continues the business.

S. M. Potts has left the Cataract mills, at Pendleton, Ind., and the business will now be conducted by Clinton Parker.

W. S. Butler, of Wheatland, Ind., has taken B. Brehmer into partnership with him in the milling business, and the style is changed to Butler B Brehmer.

Hayes & Martin, millers, Utica, N. Y., have dissolved partnership.

George Cecil & Co., millers, Logansport, Ind., have dissolved partnership.

T. Shirley, miller, Hoodville, Ill., is reported to have failed.

An assignment has been made by Ruch & Evans, millers, Pottsville, Pa. They own a large steam flour mill valued at over \$20,000, and have been established many years in business.

C. Foster & Co., millers, at Lorain, O., have dissolved partnership.

Hoese & Lemon, operating a mill at St. James, Neb., have dissolved partnership.

Coffey & Harrison, operating the Egypt mill, at Ashley, Ill., have failed, and called a meeting of creditors.

A. Meier & Son, flour dealers, at St. Louis, Mo., have dissolved partnership, and August Meier continues the business.

J. Russell of the milling firm of Russell & Miller, Valley City, Dak., has purchased the Bismarck mill, recently the property of the Bismarck Milling Co., the affairs of which have passed into the hands of a receiver. The purchaser's price was \$15,000. The new owner will make considerable changes and improvements in the mill.

OBITUARY.

R. H. Harper, miller, of Meriweather, Ga., is dead.

John P. Simpson, of the firm of Simpson & White, millers, etc., Cahto, Cal., is dead.

CASUALTIES.

A miller named Edward Slade, residing at Old Ripley, twelve miles northwest of Greenville, Ind., was drowned in Shoal Creek, on the 20th ult. He was carried over the dam on a raft and swam in to shore, but returning for his hat, which was floating down stream, was seized with cramps and drowned before help could reach him.

At Goshen, Ind., on the 26th ult., two boys, Heefner and Bartholomew, aged about thirteen, were playing in a flouring mill, when Heefner was caught by a shaft making about 180 revolutions a minute, whirled round and one arm torn from the socket; his body was thrown eighteen feet. Bartholomew was struck by Heefner's feet while he was revolving and his face badly crushed.

Daniel Tubbs, a miller at Maquoketa, Iowa, was run over by the cars at Clinton June 3. Both legs were crushed, and he died the same day. He leaves a family.

John Nelson, a prominent citizen of Waukesha, Wis., committed suicide on May 27, by hanging. He lost considerable money in the late Bozeman mill failure, and ever since has acted strangely. His family had made arrangements to have him sent to the insane asylum at Oshkosh, and while his wife was preparing breakfast he slipped from the house, and when, a few moments later, she went in quest of him she found him hanging in the barn and quite dead. Deceased leaves a wife and six children. This was his second attempt at suicide, he having taken poison a few days before.

FIRES.

The flouring mill of H. C. Wilkins, at Yeddo, Ind., burned on 30th ult. Loss \$3,500; partly insured. The fire was incendiary.

On the 29th ult., the large frame grist mill belonging to John Cockefair, situated in the eastern part of Cambridge City, Ind., was burned. The mill was an old landmark of that place, having been erected about fifty years since. Many of Mr. Cockefair's valuable papers were lost as well as some money. It seems that Mr. Cockefair has been rooming in the upper part of the mill, and it is supposed that while he was getting his breakfast, fire was communicated to the dry timbers of the mill. No insurance.

Fire fiends have been trying to destroy Columbus, Ind., and among the piles to which they have ap-

plied the torch was Gaff, Gent & Thomas' cereal mills, with very slight damage however. Joe Gen roosts in the corn-crib now with an armory of shooting-guns and a magazine of ammunition waiting for the enemy.

A fire of unknown origin burned the Lafayette Ind., hominy mills on the night of the 17th inst. The building was a four-story structure, and the fire, which was discovered at 9 o'clock, burned the building to the ground in one hour. The engine house and one crib only were saved. The mill were owned by a stock company and began work three years ago. They were equipped with a large amount of new machinery, and contained a heavy supply of manufactured goods and raw material. The total loss is at least \$50,000, and the total insurance \$29,000, in 18 companies.

The flouring mills and elevator at Clay Center Kan., owned and operated by C. R. Barnes, were burned to the ground on 29th ult., involving a loss of \$40,000; insurance, \$17,500.

The Buena Vista mills, in Buena Vista township 13 miles north of Freeport, Ill., owned by Jare Wohlford, were burned May 15. Considerable stock was also ruined. Cause of the fire is unknown. Loss, \$10,000; insurance, \$5,000.

The Dawn roller mills, Dawn, Mo., Mattingly Bros proprietors, were burned May 15. The fire was first discovered in the top of the building where the dust-room was located, and it is supposed that the cause was spontaneous combustion. The property was valued at \$20,000, and was insured \$10,000. Considerable of the contents of the lower story was saved.

The mill at Sand Creek, Minn., owned by Frank Nicolini, burned on 27th ult. Loss, \$55,000; insured for \$42,000.

The Grove City mill, at Litchfield, Minn., was burned on 9th inst., the fire being first discovered in the roof about an hour after the hands had left for supper. The origin is not understood. It was owned by C. E. Lindberg, and rented to A. P. Starbuck & Co. It was insured for \$15,000.

The Beloit, Iowa, mills, comprising one large four-story grist mill and one woolen mill, were destroyed by fire June 5; the fire was of incendiary origin. Loss, \$20,000; no insurance. The property was situated two miles below Canton, Dak. on the Iowa side of the river, and was very valuable.

A fire at Binghamton, N. Y., May 26, caused loss of \$55,000; insurance, \$11,000. Doolittle's flour and feed mill was one of the greatest sufferers.

A fire broke out in the mill of John P. Baxter, a Manistee, Mich. on the evening of May 21, and consumed the building together with the contents. Loss about \$7,000, with no insurance. The origin of the fire is unknown.

MISCELLANEOUS.

The Chicago Flour Refining Co., has filed articles of incorporation with the Illinois secretary of state. The capital stock is \$200,000, and the incorporators are Andrew Hunter, C. W. Lyon and John S. Rumsey. The object of the company is said to be the refining of flour and cereals.

The San Francisco *Commercial Herald and Market Review*, writing with enthusiastic fervor on the future of California as a wheat region declares that in the valleys watered by the Sacramento and San Joaquin rivers there are 30,000,000 acres fit for wheat, of which at least two-thirds can be depended on to produce in good seasons full twenty-five bushels to the acre.

Hon. L. M. Mering, of Richmond, Ind., who has been prominently connected with the milling industry in his state for many years, and of later year shipping his product to Europe, has concluded, since his mills were recently burned, to change location and has gone on a prospecting tour through Kansas and Texas.

Comanche, Texas, citizens raised \$7,000 for a flouring mill at that place to supply the loss of the one recently burned.

According to the report of the French consul at San Francisco, the mills of California are at present capable of turning out 2,000,000 barrels of flour annually. San Francisco has five mills, the aggregate capacity being 2,800 barrels per day. The Stockton mill makes 800 to 1,000 barrels daily, and another establishment in process of erection will turn out 800 barrels. Vallejo is to have a very large mill able to make thousands of barrels daily. There are many others of less importance, and the number increases steadily.

NOTES OF THE TRADE.

The John T. Noye M'fg Co.,
of Buffalo, N. Y., refuse to furnish reports of the sales they have made, for publication in these columns. They have taken this step in deference to the wishes of a great many of their patrons, believing that the practice, as it has heretofore existed, does not convey the impression it should.

Watson Nye.

of Kansas City, Mo., manufacturer and dresser of mill picks, who does work for more than 3,000 mills in this country and has capacity for a few thousand more, sends the following testimonials:

ENTERPRISE, Kan., May 13, 1883.

DEAR SIR: I inclose you draft on St. Louis for \$95.25, which you will please place to my credit. Your picks have been very satisfactory. My stone dresser says he has never had a bad pick from you and don't want better work.

Very respectfully, C. HOFFMAN & SON.
Enterprise Mills.

LAWRENCE, Kan., May 4, 1883.

DEAR SIR: I enclose you draft in full for \$75.80. The new picks cut fine. You did the best job of splicing on the picks I sent you that I ever saw. Respectfully

J. D. BOWERSOCK,
Douglass County Mills.

Eureka Manufacturing Co.,

Rock Falls, Ill., report that the following millers have recently purchased the well-known cone shape Becker wheat brush: A. Coors, Golden, Col.; Nicholas & Roberson, Crawford, Tex.; H. A. Kilgour, Kalamazoo, Mich.; L. B. Weisenburg, Georgetown, Ky.; Geo. Mader, Winchester, Ill.; Crouch, Whiaker & Co., Bell Buckle, Tenn.; Brown & Chatburn, Hastings, Neb.; Mauntel, Borgers & Co., East St. Louis, Ill.; Lock & Thornely, Swanville, Minn.; Baker, Cranze & Co., Wadsworth, O.; Ashland, Mill Co., Ashland, Mo.; Sessinghaus Mill Co., St. Louis, Mo.; Fremont Milling Co., Fremont, Neb.; G. Forston, Lawrenceburg, Ky.; L. M. Jackson, Nicholasville, Ky.; W. B. Bewley, Fort North, Tex.; J. H. Danielson, Fresno, Cal.; W. J. Miller & Co., Dublin, Tex.

The Central Iron Works,

St. Louis, Mo., have recently made the following deliveries; A car load of machinery to the Dallas (Tex.) Barrel and Wooden Ware Co.; a large Jumbo doctor to the Anheuser-Busch Brewing Association's brewery to supply boilers of 700 horse power; a lot of corrugated rolls to the Hoover & Walk Milling Co., Seneca, Mo.; a 9x16 inch horizontal engine, coil heater, patent steam pump and a quantity of pulleys, shafting and hangers to Mauntel, Borgess & Co., St. Louis; a No. 4 Geo. J. Fritz patent eccentric doctor, with cold water pump combined, to the Excelsior Milling Co., Louisiana, Mo.; a lot of shafting, gearing, pulleys and hangers to Little Rock, Ark., and Canton, Mo., for remodeling flour mills; a lot of shafting, pulleys and hangers to the Curtis & Co. Mfg. Co., St. Louis; an 8x10-inch Geo. J. Fritz patent engine to Shickle, Harrison & Howard Iron Co., St. Louis; a 10 horse power Geo. J. Fritz patent engine and boiler, with an independent steam pump, to the Harriestown, (Ill.) Cider and Vinegar Works; all the new shafting, gearing and pulleys for the new Wainwright brewery, St. Louis; a 2½-inch suction steam pump to the Sectional Dock Co., St. Louis; a lot of re-corrugated chilled rolls to W. M. Johnson & Co., Marshall, Mo. The concern is quite busy, and has its new catalogue for 1884 ready for mailing.

A Modest Man and His Machine.

Martin, at the Bass Foundry & Machine Co., Fort Wayne, Ind., seems to be about the busiest man in the trade. His latest "vanity" is "J. B. Martin's centrifugal eliminating flour dressing machine." He says "he don't want the earth with the moon thrown in for a potato patch" but is perfectly satisfied with present orders and prospects ahead. According to Martin's gospel there's nothing equal to the J. M. C. E. F. D. M., and judging from letters of millers using it, many other folks think so too.

Milwaukee Dust Collector Mfg. Co.,

Milwaukee, Wis., have recently furnished for Saxton & Thompson's large mills at Lockport, N. Y., and Geo. T. Chester's mill of the same place, a full line of Prinz dust collectors.

Nordyke & Marmon Co.,

Indianapolis, Ind., report the following orders:

From J. A. Banta & Co., Macon, Mo., rolls and bolting diagram for remodeling their mill.

From Coombs & Bro., Memphis, Ind., to remodel to the roller system at a cost of \$4,000.

From Hastings, Whissen & Co., Reinersville, O., to remodel to the roller system.

A flouring mill outfit for Chihuahua, Mexico, was shipped last month.

From M. E. Burke & Co., Mt. Victory, O., rolls and other machinery to remodel their mill to the roller system.

From Dwiggin & Shepherdson, Petersburg, Tenn., machinery for a roller process mill.

From Mason, Peak & Co., Sonora, Ky., plans and machinery for building an elevator.

Machinery for three new mills on the roller system for Woods & Morphis, Black Jack Grove, Tex.; M. W. Deavenport, Denton, Tex., and Comanche Roller Mills, Comanche, Tex.

Cumner Engine Co.,

Cleveland O., have received the following orders:

The Pennsylvania Railroad Co., have just placed their order for an automatic engine, after a thorough investigation of the various automatic engines by their experts, who visited various manufactories and examined the engines in operation and in course of construction.

From Porter & Worrel, Cisco, Tex., 55 horse power; Stults & Kile, Orwell, O., 67 horse power; Fort Wayne Electric Light Co., Fort Wayne, Ind., 55 horse power with complete outfit; Lorin Mitchell, Wausau, Wis. 105 horse power; A. L. Johnson & Co., Muncie, Ind., 137 horse power and Cheesman & Dreisbach, Reno, Kan., 75 horse power.

They have also just shipped their Ballantine ice and refrigerating machines to Albert Ziegele & Co., Buffalo, N. Y., and expect to be able to ship three more of these machines, of large size, within the next two weeks.

Case Manufacturing Co.,

have reported the following orders:

From J. A. Nogle, Lodi, O., a full line of breaks, rolls, purifiers, scalpers, etc., for a full roller mill.

From A. Comingo, Pleasant Hill, Mo., breaks, rolls, purifiers, scalpers, etc.

From Playter & McCullough, Walnu, Kan., one "Little Giant" break machine and scalper combined and one improved centrifugal reel.

From Henry Schuser, Mt. Vernon, Ind., a three-roll break machine and a scalping reel.

From H. O. Lambaugh, Providence, Tenn., a full outfit of breaks, rolls, purifiers, scalpers, etc.

From S. A. Keely, Lewisville, Tex., breaks, rolls, purifiers, scalpers, centrifugals, etc.

From Wm. Craig, New Castle, Ind., one "Little Giant" break machine and scalper.

From Robinson & Son, Rochdale, Eng., five sets of rolls.

From Hales & Ault, Elizabeth, Pa., a full line of breaks, rolls, purifiers, scalpers, centrifugals, etc.

From E. C. Atherholt, Brookfield, Pa., two pairs of rolls with patent automatic feed.

From W. P. Hambaugh, Ringgold, Tenn., two pairs of rolls with patent automatic feed.

From Moreland, Hull & Co., Dublin, Mo., three pairs of rolls with automatic feed.

From J. M. & H. C. Allen, Grafton, Ill., one No. 1 double purifier.

From J. W. Cleaver, Caro, Mich., two pairs of rolls with automatic feed.

From B. S. Edwards & Co., Chetopa, Kan., a full gradual reduction mill.

The Lechner Manufacturing Co.,

Columbus, O., have recently made large shipments of their roller detachable chain elevators, conveyors and drive belts to Wisconsin, Pennsylvania and New York. Their chains are rapidly coming into general use throughout the country. Owing to their peculiar construction they possess great strength and are very durable. Parties needing anything in their line will do well to correspond with them.

Edmands Manufacturing Co.,

Hamilton, O., has the following from A. Fulrath, Mt. Carroll, Ill.: The Smutter gives good satisfaction. I claim it the best machine in the United States. The same company has sold and shipped to Liverpool, Eng., one Standard Brush, one Combined Separator, Brush and Smutter and one Standard Separator and Grader. Carroll & Neely, Russellville, Ky., have also ordered one No. 1 lengthened scourer.

Peanut Flour.

No doubt ere long "peanut flour" will be an important product of the South. Virginia is set down this year for 2,100,000 bushels, Tennessee for 250,000 and North Carolina at 135,000 bushels, these being the chief states engaged in their cultivation, and those in which it was first introduced from Africa. In Virginia they are called "peanuts," in North Carolina "ground peas," in Tennessee "goobers," and in Georgia, Alabama and Mississippi "pinders." Virginians are beginning to turn the peanut into flour, and say it makes a peculiarly palatable "biscuit." In Georgia there is a custom now growing old, of grinding or pounding the shelled peanuts and turning them into pastry, which has some resemblance, both in looks and taste, to that made of cocoanut, but the peanut pastry is more oily and richer, and, we think, healthier and better every way. If, as some people believe, Africa sent a curse to America in slavery, she certainly conferred upon her a blessing in the universally popular peanut, which grows so well, throughout the Southern regions that we shall soon be able to cut off the now large importation altogether.—*Savannah Telegram.*

A Senatorial Grahamite.

When Senator Palmer, of Michigan, goes to New York and stops at the Fifth Avenue Hotel, he always carries a loaf of graham bread in his satchel. Before going to his meals he cuts a couple of slices from the loaf and puts them in his pocket. At the table he pulls the bread out and has always something before him he can eat. In his house at Detroit he has a mill constructed on purpose to grind this bread, and at home he will never eat bread made from flour ground at any other mill. When he first came to Washington he was invited to so many parties and was obliged to eat so much that he was distressed and sick most of the time. At a dinner party later in the season, however, he happened to notice that Senator Mahone skipped every other course and only barely tasted of the dishes he took. He profited by this suggestion, and since then, when invited to dine, he keeps his jaws in motion, but only nibbles at his food.

Changes in Classification and Rates.

Commissioner Fink issued the following on the 13th inst.: "At a meeting of the Joint Executive Committee this day it was agreed that the following articles in car-loads now in the eighth class be placed in a special class, viz.: "Grain, flour, feed, bran meal, middlings, oil-cake, meal and cotton, seed-cake and meal, and that taking effect on Tuesday, June 24, next, rates thereon shall be on a basis of 20 cents per 100 pounds from Chicago to New York, and taking effect July 21 prox., the rate will be advanced to the basis of 25 cents per 100 pounds."

Polish for Pine Wood.

A wash of one part nitric acid in ten parts of water will impart a stain resembling mahogany to pine wood that does not contain much resin. When the wood is thoroughly dry, shellac varnish will impart a fine polish to the surface. A glaze of carmine or lake will produce a rosewood finish. A turpentine extract of alkanet root produces a beautiful stain which admits of French polishing. Asphaltum thinned with turpentine makes an excellent mahogany color on new wood.

A curious coincidence has been dug out of American history, showing that on Oct. 30, 1781, the continental congress elected the first secretary of war, whose name was Benjamin Lincoln. In 1881, just a century later, the present secretary of war, Robert T. Lincoln, was appointed.

SPECIAL NOTICES.

WHEELS FOR SALE.

Second-hand, of several makes and sizes. If new wheels are wanted, the Flenniken Turbine is the best in the world to buy. Send for new catalogue. Address FLENNIKEN TURBINE CO., Dubuque, Iowa.

BOLTING CLOTHS.

Millers will consult their own interests to write for prices on Bolting Cloths to G. R. GALE MFG CO., Cleveland, O., if they want the best quality of Cloth at the lowest prices.

Safe for Sale.

A large and almost new Hall safe, suitable for mill office, for sale. Original cost \$800; will be sold for less than half the money. Address THE MILLSTONE, Indianapolis, Ind.

For Sale, Cheap!

Two run of 42-inch diameter, close old stock buhrs.

One 36-inch double geared portable middlings mill

One 30-inch belted portable middlings mill.

One No. 3 Excelsior middlings purifier.

One No. 4 Excelsior middlings purifier.

One single 24-inch Allis roller mill.

All in first class order and not used very much.

Address BARNEY & KILBY, Sandusky, O.

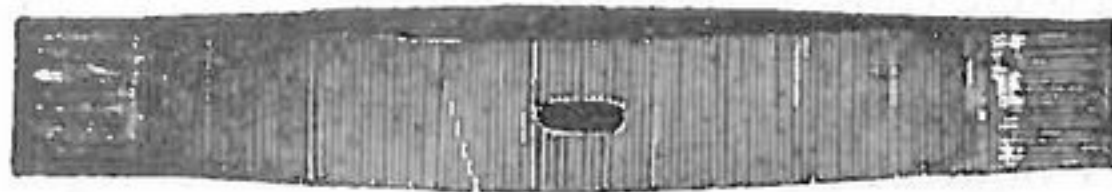
NONE BUT FIRST CLASS GOODS.

In Watches, Jewelry and Silverware one should have the best or none. Messrs. SHURLY & Co., Chicago, are making a specialty of fine goods, and if you need anything in Watches, in dust and water proof cases, Solid Silver or Triple Plated Ware, Solid Gold or Rolled Gold Jewelry, send to SHURLY & Co., they will send a single article at the dozen price. They are vouched for and indorsed by the United States Express Co., American Express Co., Southern Express Co., F. W. Palmer, Postmaster of Chicago, Gen'l John C. Smith, ex-State Treasurer, and many others. Goods sent on approval, with privilege of examination, enabling you to do your purchasing at home. Remember, Shurly & Co., 77 State St., Chicago, Ill. SEND FOR THEIR NEW AND BEAUTIFULLY ILLUSTRATED CATALOGUE.

Something About a Good Thing.

We imagine there are now but very few offices in this country that employ the old-time system of filing letters, with which many of the older book-keepers are acquainted. The plan we refer to was that of folding each letter and carefully backing it with the name and address of the writer, a memorandum of the date, and an epitome of the contents. There were variations in this plan, but in its essential features it was, up to a short time ago, the almost universal plan in use. The first steps toward a modification of this, with which we are acquainted, was pasting the letter upon stubs in books arranged somewhat after the style of scrap-books. We have in mind one firm that accumulated in this manner a correspondence sufficient to fill, in a comparatively short time, cases on three sides of a somewhat commodious office. The convenience of the modern letter-file, as compared with the plan just mentioned, is appreciated by every one who gives the subject the least attention. Messrs. Cameron, Amberg & Co., Chicago, New York and London, manufacturers of the "Peerless" Letter File, have given the subject of filing papers great attention, and have reduced the work to an absolute system. Those who are considering the expediency of changing their office routine in matters of this kind, will obtain much useful information on the subject by procuring Messrs. Cameron, Amberg & Co.'s pamphlet.—*The Book-keeper.*

Toledo Mill Pick and Stone Tool Manufacturing Co.



Manufacturer and Dresser of

MILL PICKS.

Made of the very best double-refined English cast steel. All work guaranteed. For terms and warranty, address GEO. W. HEARTLEY, No. 299 St. Clair Street, Toledo, O. Send for Circular

N. B.—All Mill Picks ground and ready for use. (both old and new) before leaving the shop. No time and money lost grinding rough and newly dressed Picks. All come to hand ready for use.

ALSO MANUFACTURERS OF

SHAFTING, PULLEYS, HANGERS, COUPLINGS
And Machine Jobbing.

FOR SALE, WANTED, ETC.

Wanted, a Position as Engineer.

Best reference given and good reasons for wishing to change. Address C. W. C., Box 63, Knightstown, Ind.

Wanted, Situation.

By a practical miller of 18 years' experience. Understands new and old process. Am a good buhr dresser. Address MILLER, No. 46 Fletcher avenue, Indianapolis, Ind.

For Sale or Exchange for Real Estate.

A good two-run steam mill situated in Carthage, Hancock county, Ill.; will sell one-half interest to a good miller. The mill is in good running order. Address J. H. WOLFE & SON, Carthage, Ill.

Second-Hand Engines for Sale.

A lot of good second-hand engines, different makes and all sizes. Some specially adapted for flour mills and saw mills. Good order. HADLEY, WRIGHT & CO., 113 to 125 South Tennessee street, Indianapolis, Ind.

Partner Wanted.

The proprietor of a good custom and merchant flour mill would like to correspond with a practical miller with a view to a partnership, or would sell mill entire. Address H. B. M., P. O. Box 59, Bardstown, Ky.

For Sale or Lease.

A mill dam just built. Ample power for 300-barrel mill. Situated at a growing town in a booming country, on the finest milling stream in Nebraska. For particulars write to M. L. HOLMES, Holmesville, Gage county, Neb.

For Sale or Exchange.

A splendid seven-run, water-power mill, in Washington county, Kansas; nearly new. Will take part pay in good land. This is a good opening for a live man to make money. For particulars address S. F. BENSON, Hollenberg, Kan.

Buhr Dresser and Picks for Sale.

One Barnes Diamond Buhr Dresser; cost \$70, a bargain at \$40; only used a few times. One dozen mill picks, 2½ and 3 pounds, Rogers, of St. Louis, maker, ten of which have never been used, at 40c per pound, cost 75c. Address H. L. GIERS, East Dubuque, Jo Daviess county, Ill.

Kansas Mill for Sale.

Situated on the St. Louis & San Francisco railroad, in one of the best wheat sections of the West, in a thriving young town, with the prospect of a cross railroad and the county seat. Price, \$5,500. For particulars address PRATHER & SON, Altamont, Labette county, Kan.

Kansas Mill Property for Sale,

And 80 acres of land. The mill is a good two-run custom water mill, with a splendid water power. Located four miles east of Lenora, on the Central Missouri Pacific railroad. Terms, \$2,000 cash, and \$1,000 on twelve months' time. Address G. A. LATHROP, Lenora, Norton county, Kan.

For Sale Very Low.

A two-run steam flouring mill in three-story frame house; building 24x50; in one of the best wheat districts in the West; situated in a small village surrounded by good farms. Mill in good order and doing good custom business. Good saw mill attached. Address or call on N. G. & J. B. CALDWELL, Caldwell, Mo.

A Money-Making Mill for Sale.

In Southern Michigan, on railroad track in town of 1,200 inhabitants. Mill been in operation five years; improved machinery. Can show this to be a valuable location and money making; will sell for part cash; balance on long time, if desired. Call on or address J. J. BALCOMB, Decatur, Mich.

Wanted.

A situation and interest in a good mill in a good locality by a practical, double-entry book-keeper. Have had considerable experience in custom and merchant mills and in buying grain. Can invest two thousand fully. Am not afraid of work. For further particulars address P. O. Box, No. 63, Gallipolis, Gallia county, O.

FOR SALE, WANTED, ETC.

For Sale or Exchange—Land and Water Power.

I will sell on reasonable terms, 80 acres of land with two dwellings, barn, orchard, good stone dam, water wheel, and the stone walls of a mill recently burned. Location good for a custom mill to a man with ample capital to rebuild. Would exchange another mill and pay small cash difference. Address H. L. GIERS, East Dubuque, Jo Daviess county, Ill.

For Sale or Exchange

For a farm or other good property, a roller mill complete; 20 to 40 barrels capacity. Never failing water power, good solid mill house. Plenty of wheat at hand; good demand for flour. Located on Val railroad, in nice village. Dwelling and 11 acres land. Not for rent. Only those who mean business need apply. W. F. AMENDT, Pierce, Stark county, O.

An Indiana Mill for Sale.

One of the finest water-power flouring mills Northern Indiana. Has rolls, purifiers, and everything first-class. Fifty acres of land, with good orchard, large barn and a number of other buildings also my residence, which is a very large, nice brick house. Can be bought on long time. No postcards answered. For particulars address the Editor of THE MILLSTONE.

One-Half Flouring Mill Given Away

I will sell my steam flouring mill at one-half real worth to a proper person, or will sell the machinery and engine and keep the ground and building, or will sell mill machinery and engine separately. I am getting old and wish to retire. Machinery is new improved and in excellent order. For list machinery, price and terms, address JESSE HIAWASSEE, Peru, Iowa.

Mill for Rent.

Valuable flouring mill belonging to an estate rent for five or more years, located on the Erie canal in the city of Lockport, N. Y. The mill and warehouse are of stone, substantially built, having seven run of stone and all necessary machinery. Ample room for rollers. Two railroad depots contiguous. Superior water power with Leffel turbine running the mill. Terms very moderate. Apply L. A. SPALDING, Lockport, N. Y.

Water-Power Mill for Sale.

With three run of stone, one set of E. P. Allis & Co. 9x18 Double Roller Mills and one set of Rounds' sectional rolls, 9x30, three breaks, and one set of scara rolls, six reels and three purifiers, and all other machinery necessary to do first-class work. Situated about 30 rods from the C. & N. W. railroad, depot about one-half a mile from the C., M. & St. P. railroad. Mill was remodeled last fall. Will sell cheap. For particulars call on or address UEHLING BROS., Tonawanda, Rock county, Wis.

Water Mill for Sale

At Whitehall, Trempealeau county, Wis. Mill built in 1878. Five run of stone, easily converted into roller process. Plenty of water the year round. Good custom trade. Can command Wisconsin piney trade. Home demand for all offals. Supply of wheat for first hands. Mill 40 rods from depot. Side track mill can be procured. Whitehall is a thriving town and county seat. Good reasons for selling. Address proprietors at Whitehall, Wis. WHITEHALL MILL CO.

For Sale.

A new process flouring mill with unfailing water power. The machinery consists mainly of 1 Le water wheel; 1 break machine and scaler; 2 48-inch wheat stones; 1 48-inch corn stone; 1 36-inch middlings stone, with all the latest improved bolts, purifiers, cleaners, brush machines, etc., required for first-class new process mill upon this system. Mill was built new within the last two years, is situated in the town of Milton, Ind., having a population of 1,500, two railroads and four turnpikes. It is for sale on accommodating terms. NORDYKE & MARMON CO., Indianapolis, Ind.

Machinery for Sale.

Three pairs 36-inch new stock, French buhrs, fitted with sun, fitted with drivers, bushes, and roller balanced. Are nice for spring wheat grinding. Two pairs 48-inch, new stock, French buhrs, same fixtures as above stones. Are nice close, even stones, and for hard wheat are just the thing.

We offer the above stones at about one-half prices. They must be sold soon, and this is the chance to get some good stones cheap.

Also the following machinery, all in good order at less than one-half price.

One No. 2 Eureka Smutter, long scourer, with sh against sun. List price \$210.

One No. 0 Silver Creek smutter, with shoe, with sun. List price \$125.

One No. 2 California separator, only. List price \$125.

One No. 2 Eureka smutter, with sun, with sh against sun. List price \$190.

One No. 3 Silver Creek smutter, with sun, with shoe. (Was used one month only.) List price \$240.

One Taggart style roller packer. List price \$80.

Six sets of Stevens four-roller mills, new, direct from the factory, special bargain offered.

Several hundred feet of wood conveyors in box with flights and gudgeons set; all good as new, 65 cents per foot less discounts as above. Address NORDYKE & MARMON CO., Indianapolis, Ind.

FOR SALE, WANTED, ETC.

Undivided Two-Thirds Interest for Sale.

In the Kellogg (Iowa,) steam mill, This mill has within the last thirty days been changed over to the gradual reduction system of milling. The improvements consist of two Garden City reduction mills, two brush scalpers, one wire scalper, one pair of Allis' double rolls, one corrugated for bran, one smooth for germ, one pair 40-inch French Buhrs for third break, one pair 40-inch French buhrs for middlings and one 20-inch buhr for middlings, new bolts and new bolting cloths on old reels, three purifiers, one a French the other a Garden City, one centrifugal reel, and one pair of 30-inch buhrs for corn. The mill is equipped so that we can make three different grades of flour and clean up as we go. The mill has all it can do, is located in a live town of 1,300 inhabitants. A No. 1 location for milling. Can get all the wheat the mill can grind delivered at the mill door. Address A. E. C., care of THE MILLSTONE, Indianapolis, Ind.

Mill and Land for Sale.

I offer my mill and land for sale consisting of 335 acres; 50 acres under cultivation, 180 acres inclosed with a good wire fence into a pasture, Splendid location for stock raising; good spring of running water in pasture. Also 20 acres of young timber. Of the 335 acres, 300 could be cultivated if desired. Good frame house, 24x38; also laborer's house, 14x16. Mill house, 20x40 two stories high, frame, with good custom outfit, consisting of three run of buhrs—one 48-inch, for wheat; one 36-inch, for middling, and one 24-inch, for corn; smutter, purifier, two-reel chest. Everything in good shape and doing a fair business. Driven by a "Little Giant" water wheel of 44 in. diameter, under an 8-foot head, on the Smoky Hill river, which heads in Colorado, 200 miles above the mill. Good and substantial stone-and-brush dam on solid soapstone bottom. Mill stands on a rock ledge, 30 feet above water, where no high water ever comes. Tunneled out around the end of dam for head and tail race. No danger of ever washing out or of any similar trouble. The fall can be increased 20 feet by cutting across the bend of river, 1,300 feet; 800 feet of this I have already tunneled, leaving only 500 feet to complete the work. Mill is 6½ miles from Bunker Hill, Russell county, Kan. Wheat in any quantity can be bought at mill door. Plenty of custom to keep mill going most of the time. I will take \$30 per acre for the property, one-half cash in hand, balance to suit purchaser. No better point for a man of means can be found in the state of Kansas. Address E. NICHOLS, Bunker Hill, Russell county, Kan.

FOR SALE!!

Nine Full Sets of the "celebrated" STEVENS ROLLS, made by the John T. Noye Manufacturing Co., Buffalo, N. Y. Six of them were sent to the Commercial Mills, Detroit, Mich., in December last, but were taken from there without having been put in operation or having been touched by fire, and our rolls substituted. They were made from the present patterns of the John T. Noye Mfg. Co., and have their late so-called "Holt belt drive," (or words to that effect.) We will furnish smooth rolls with these machines, or any kind of corrugations, to parties who may object to the Stevens corrugations.

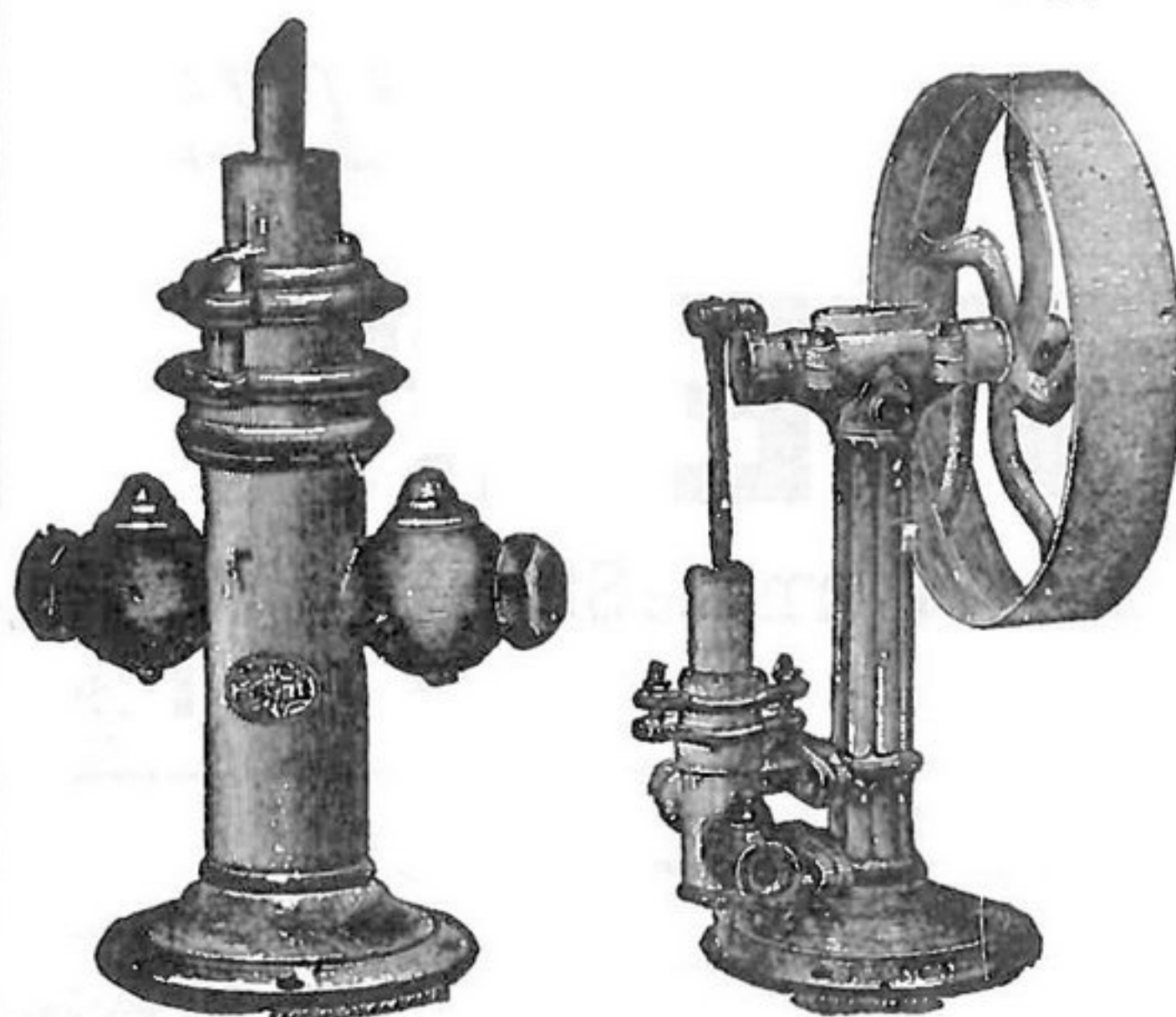
Three Geared Sets we have recently taken from the celebrated Elk Horn Mills, of H. D. Rush & Co., Leavenworth, Kan., where our rolls are being placed.

All of these rolls were made at Ansonia, Conn., and are of the same make as those used by the John T. Noye Mfg. Co.

We offer these rolls at one-half list price. Please write for particulars.

NORDYKE & MARMON CO.,
Indianapolis, Ind.

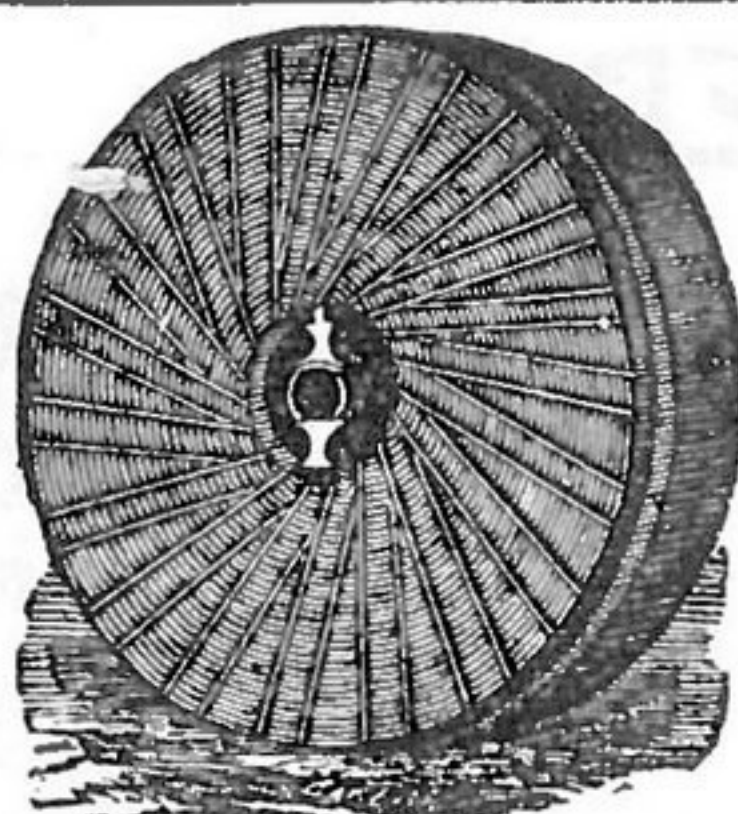
Steam Boiler Pumps.



We manufacture over forty different styles and sizes of Steam Boiler Feed Pumps, for hand and power, at prices from \$10 to \$100.

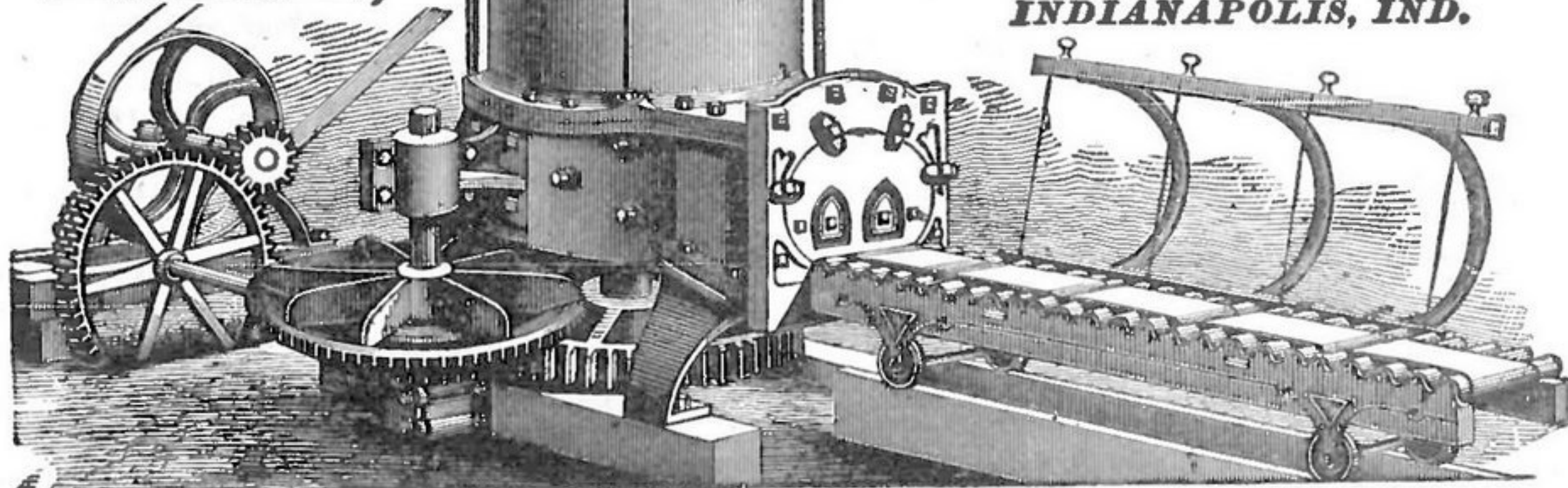
Catalogues furnished on application.

RUMSEY & CO., Seneca Falls, N. Y.



Having been engaged in working the quarries and the manufacture of Esopus Mill Stones, Chasers, &c., for the past thirty years, we are prepared to fill all orders, not only at the lowest prices, but also of the best qualities.

Eureka
MAKES
Round,
Octagon,
Gothic and
Oval Shaped
TILE,



Tile Machine,

for HORSE and
STEAM POWER

MANUFACTURED BY

Chandler & Taylor,
INDIANAPOLIS, IND.

IMPROVED
THOMPSON STEAM ENGINE

INDICATOR,

PLANIMETER

AND

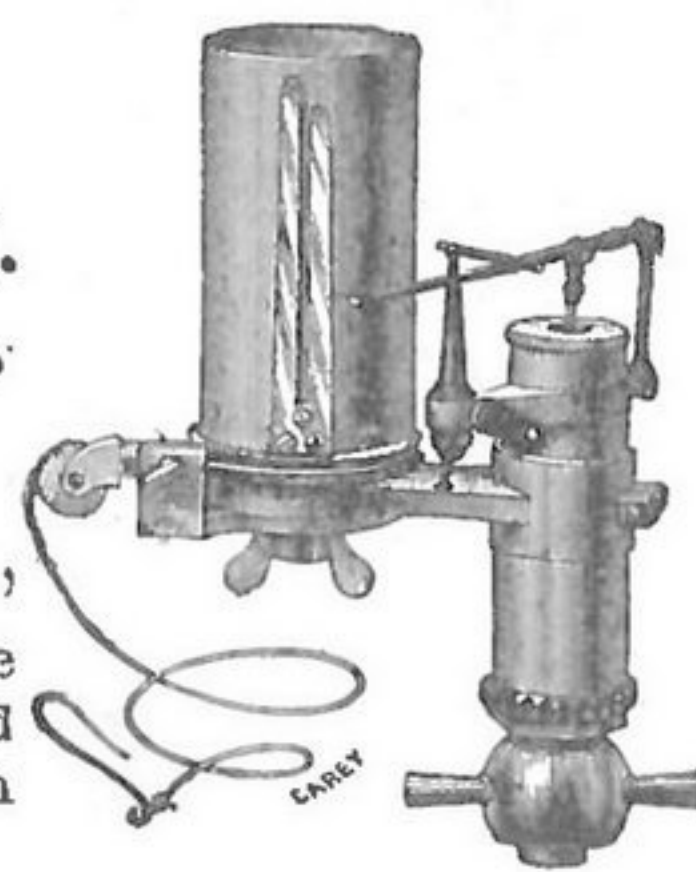
PANTOGRAPH.

Manufactured solely by

THE

American Steam Gauge Co.,

Original Steam Gauge
Co. Business established
in 1851. Incorporated in
1854.



36 Chardon Street, Boston, Mass.

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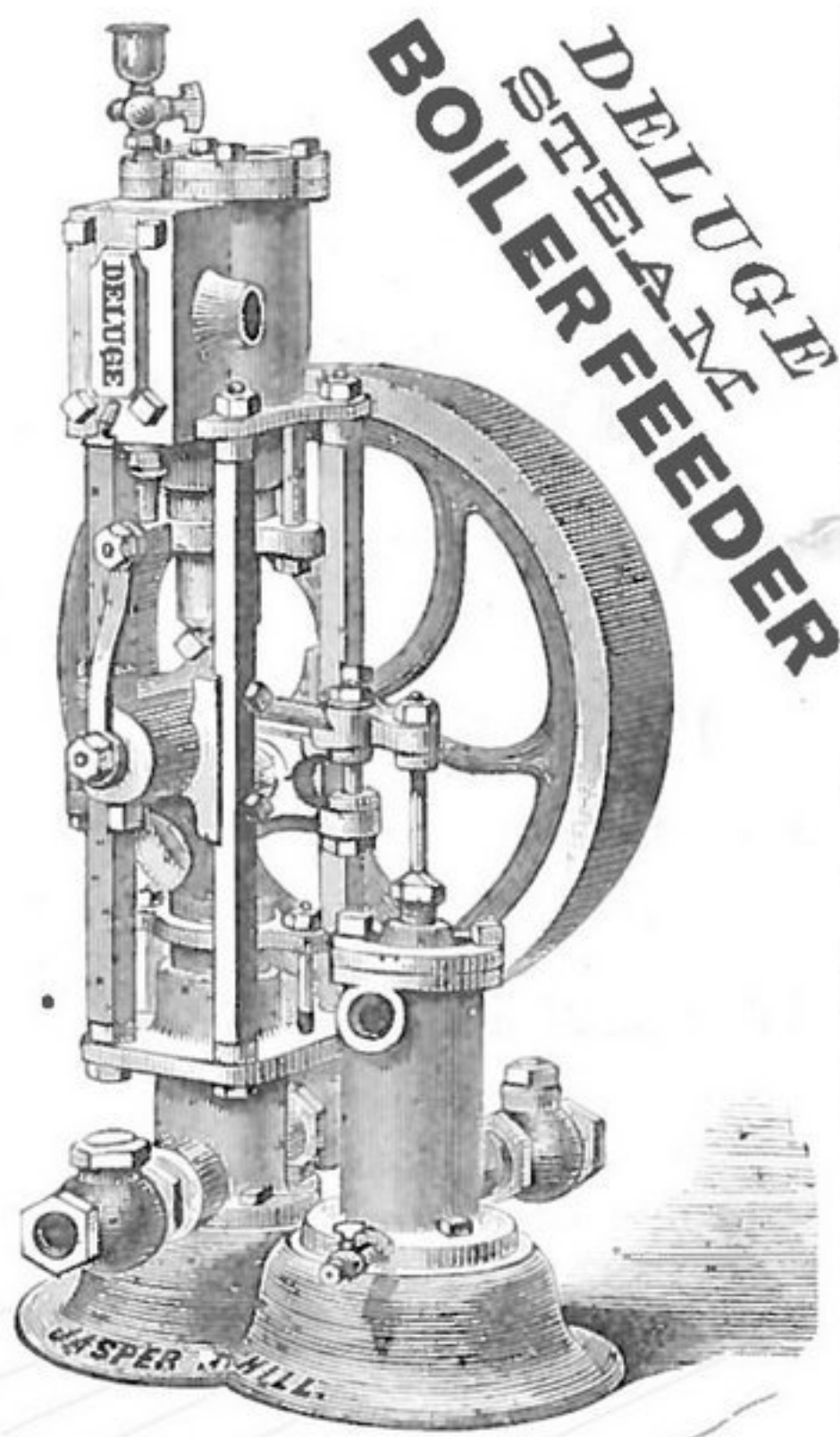
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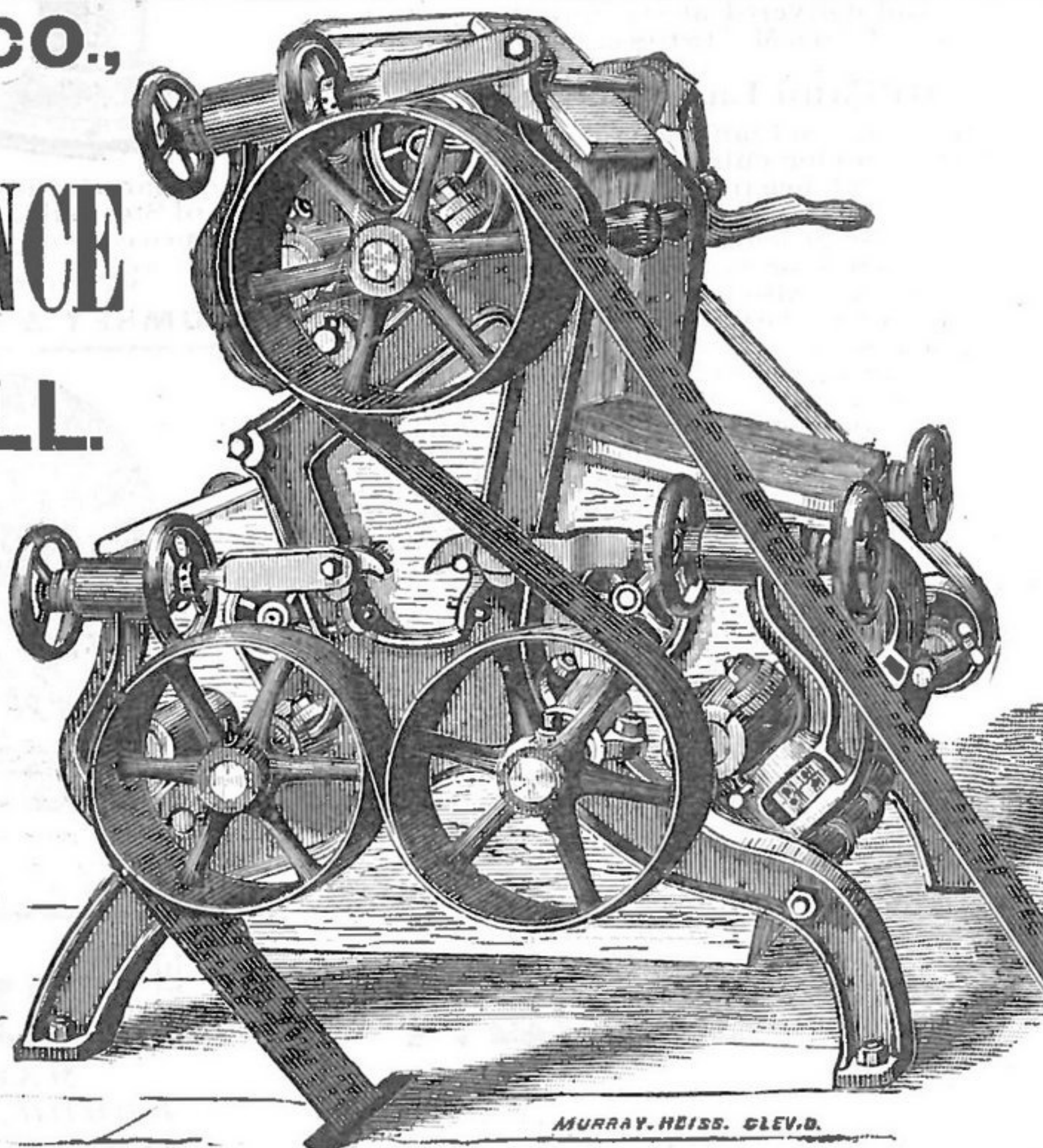
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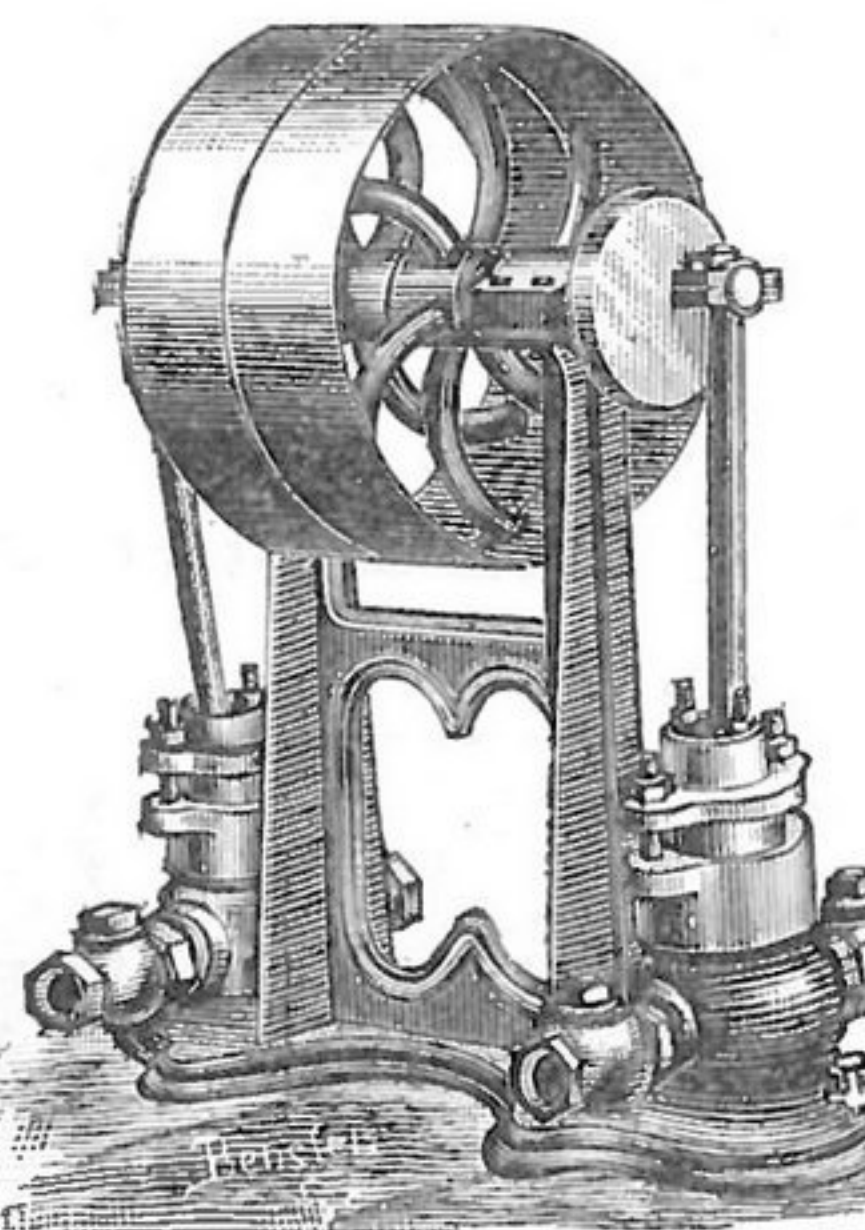
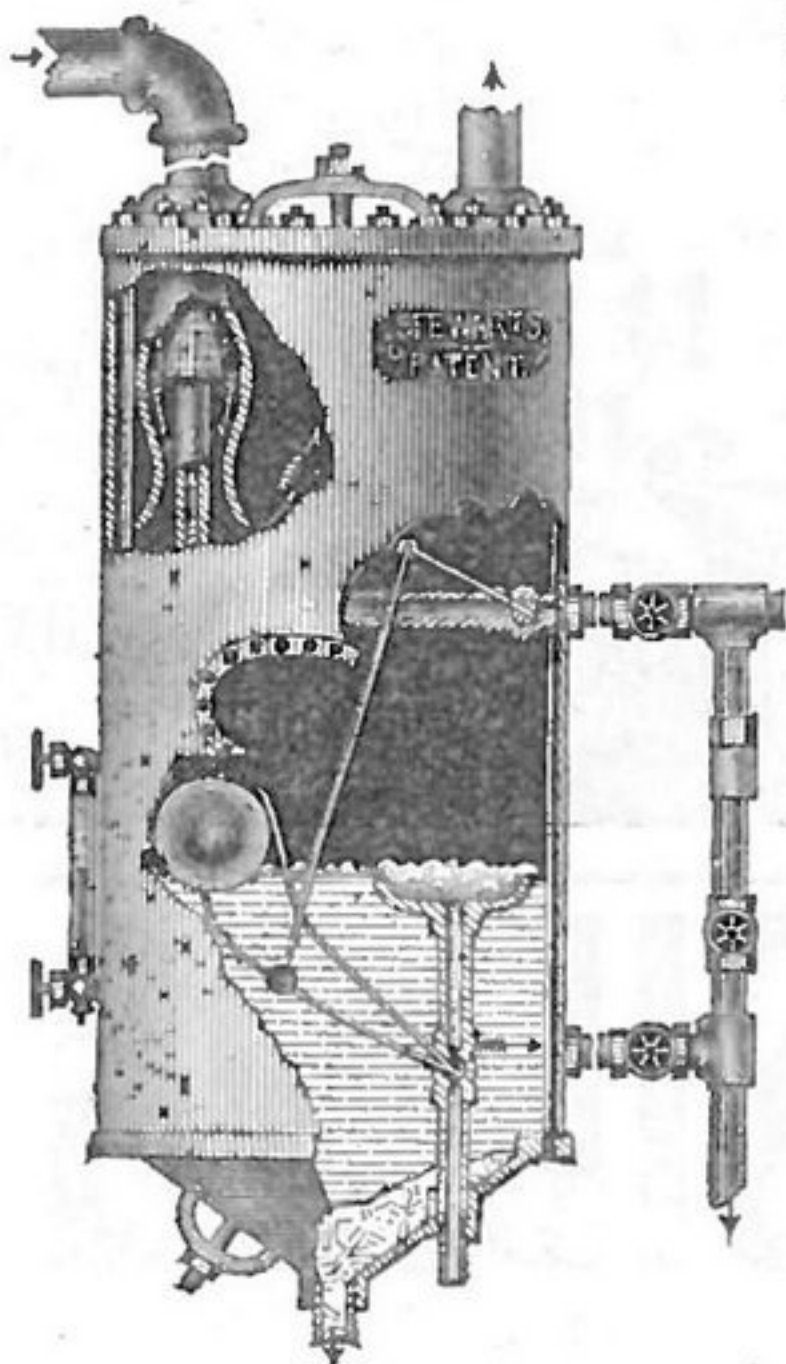
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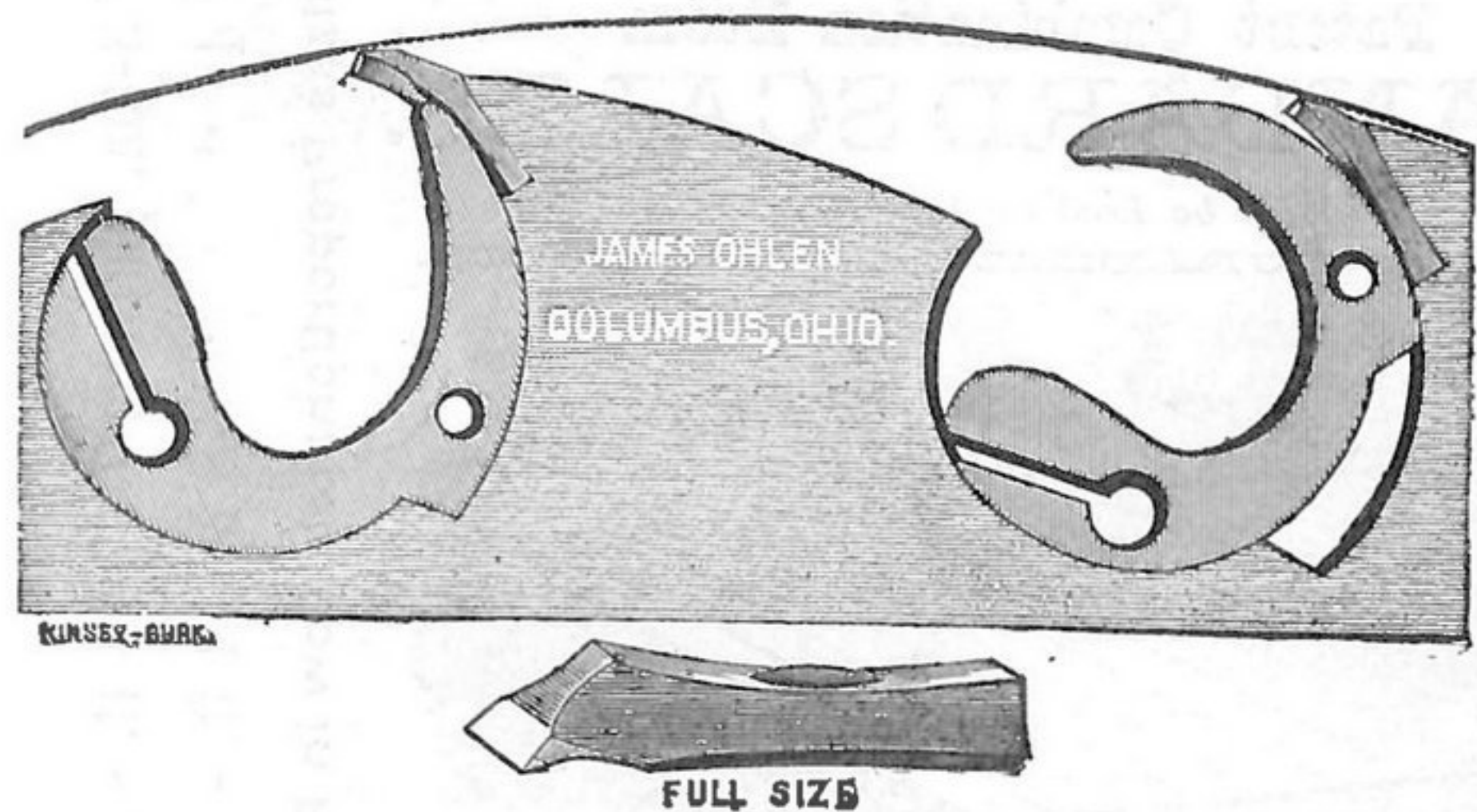
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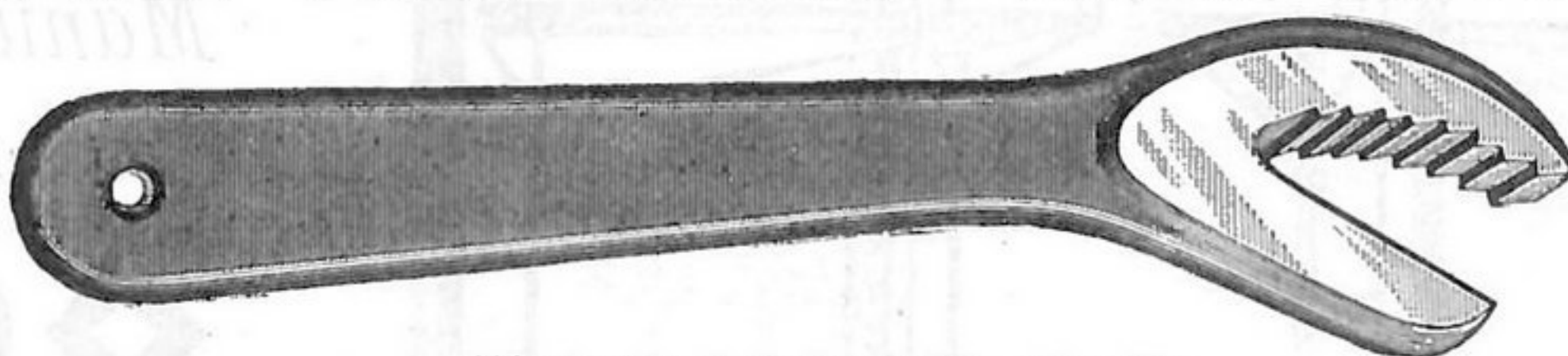
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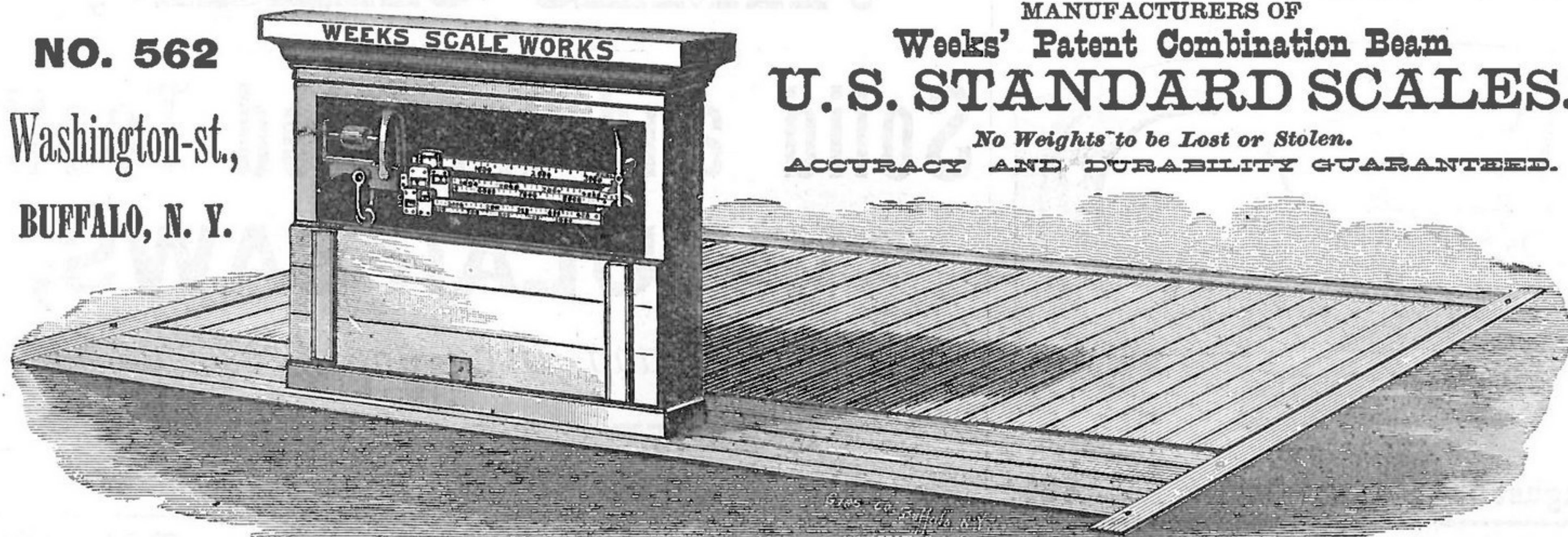
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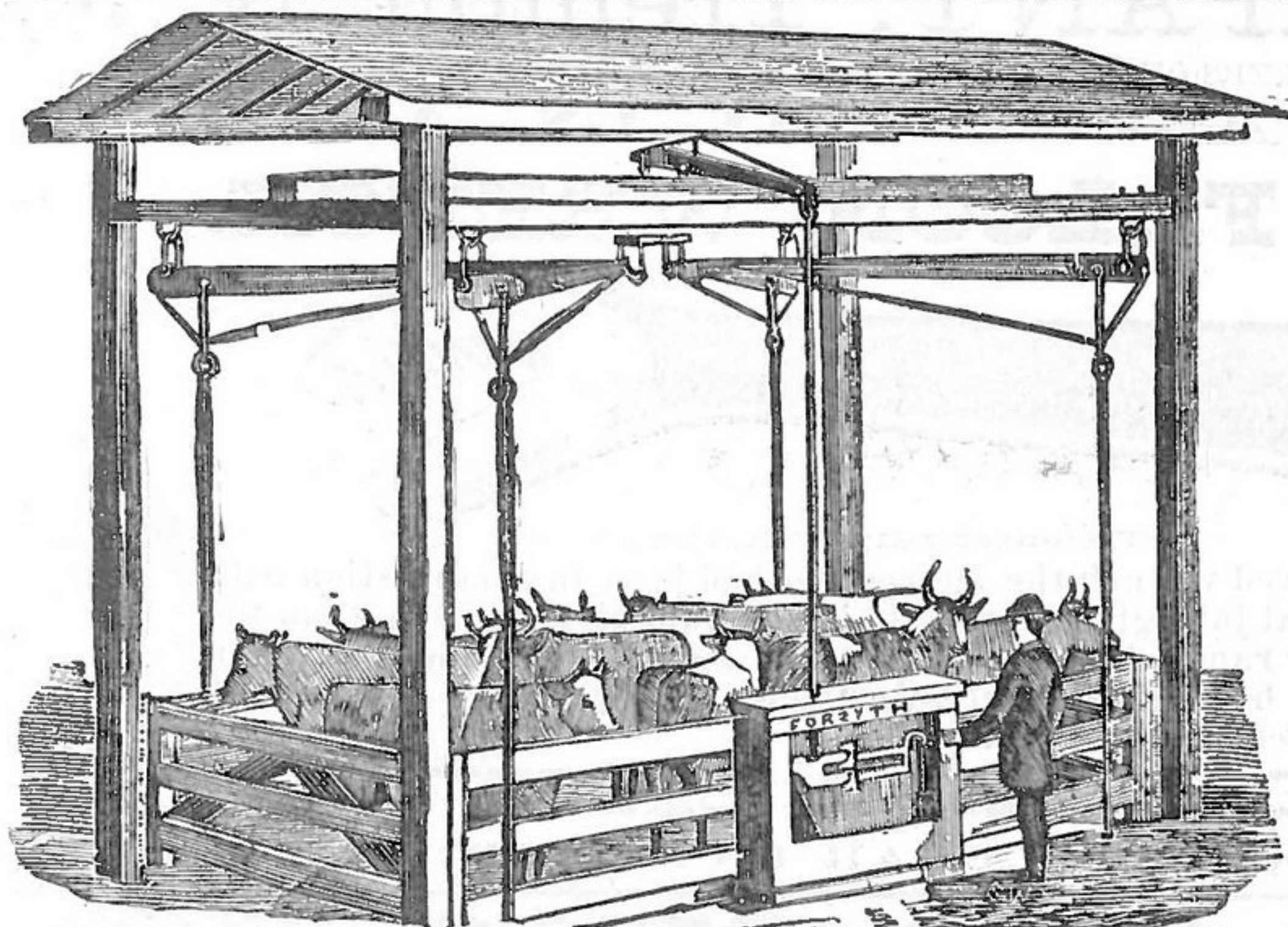
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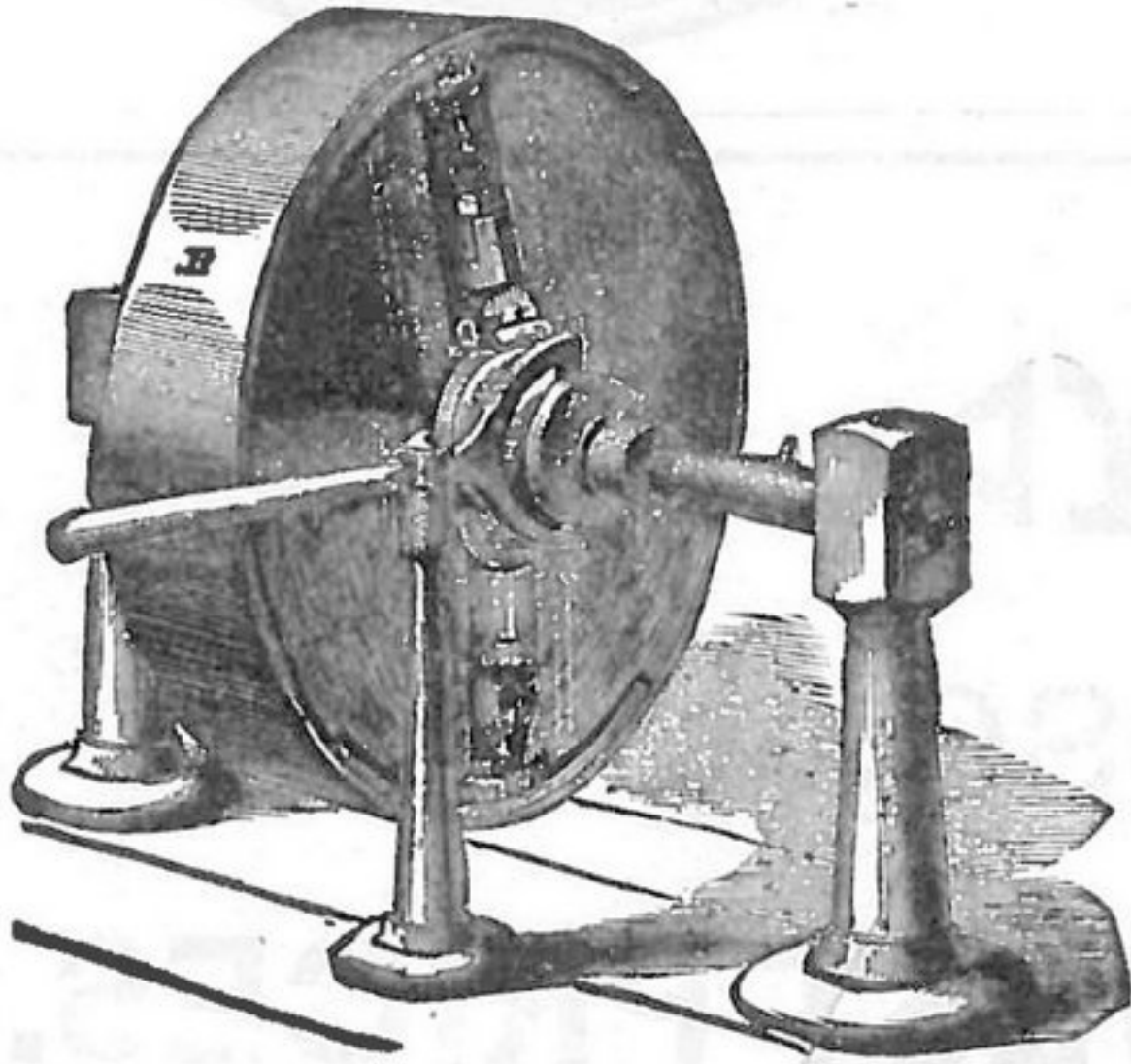
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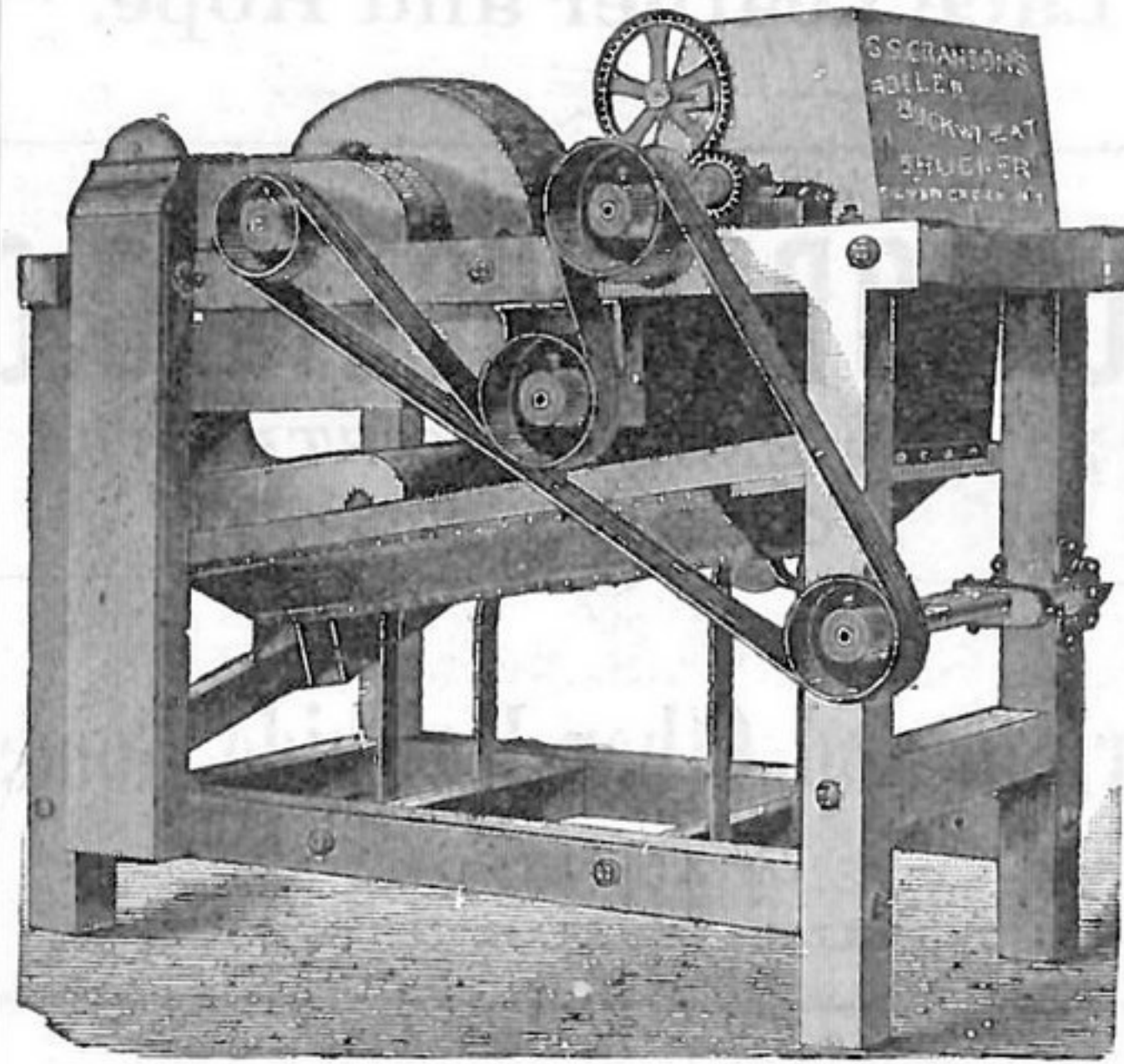


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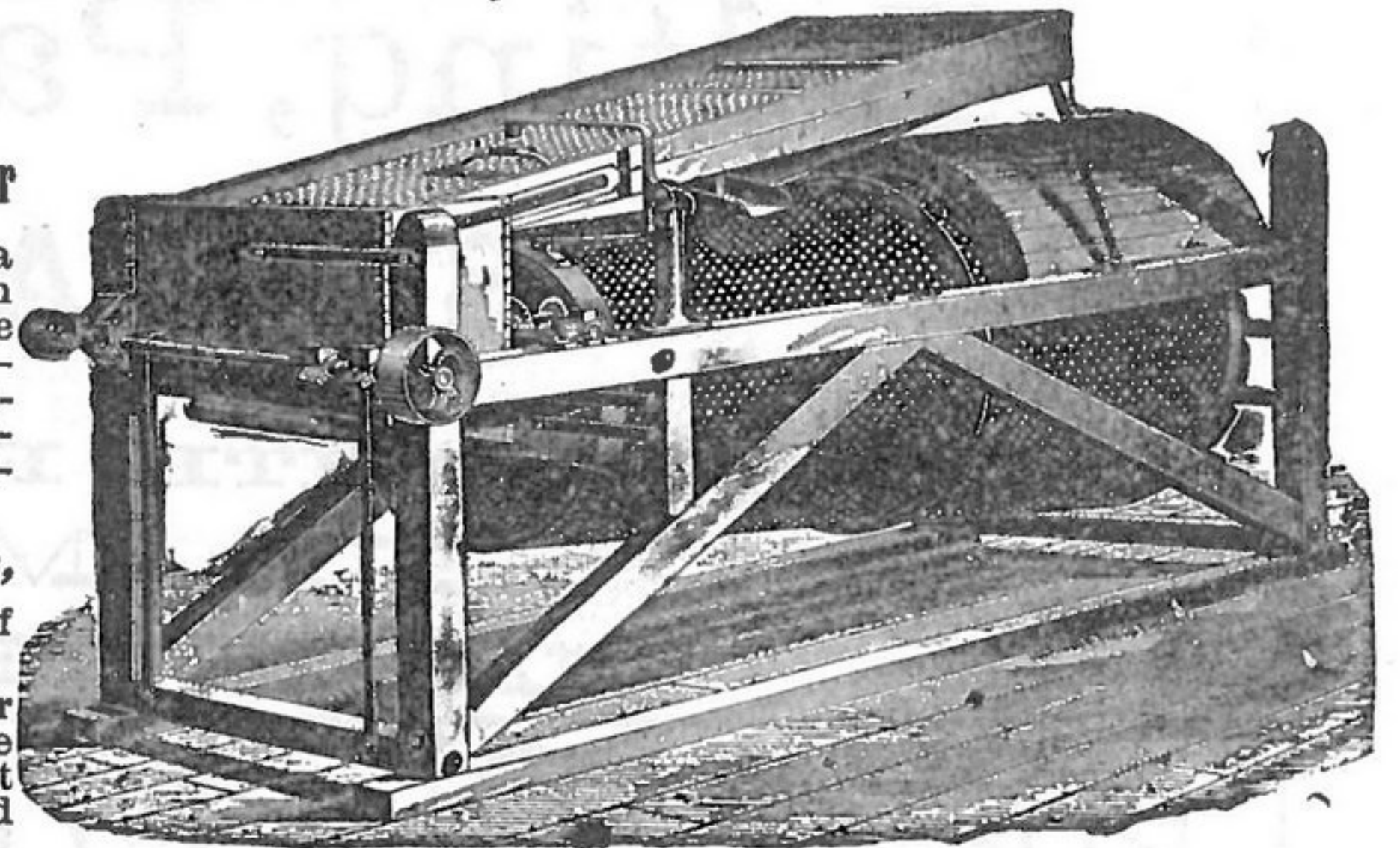
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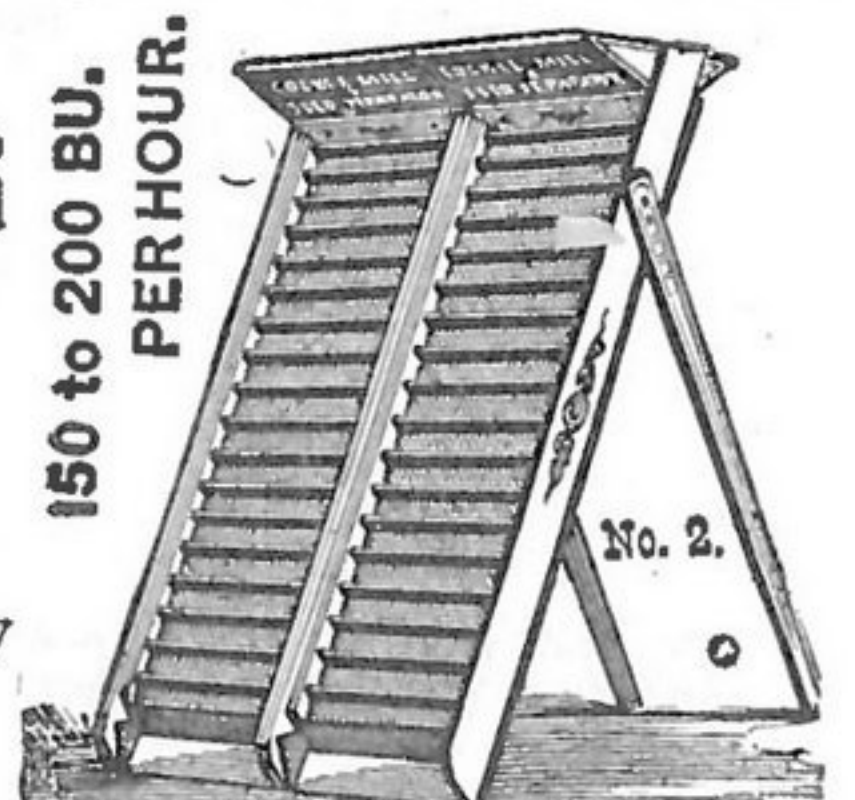
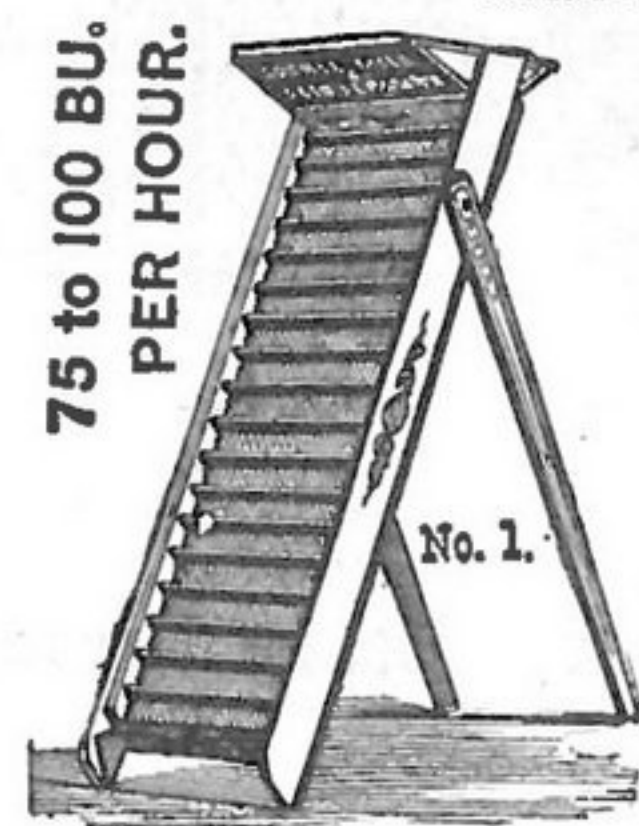
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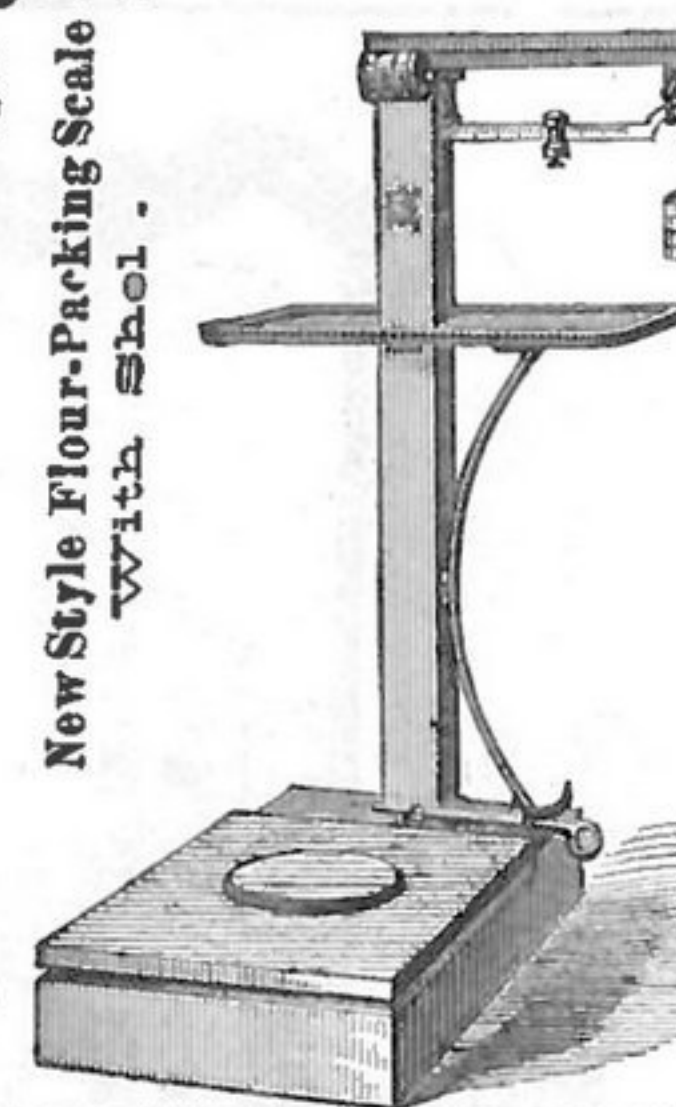
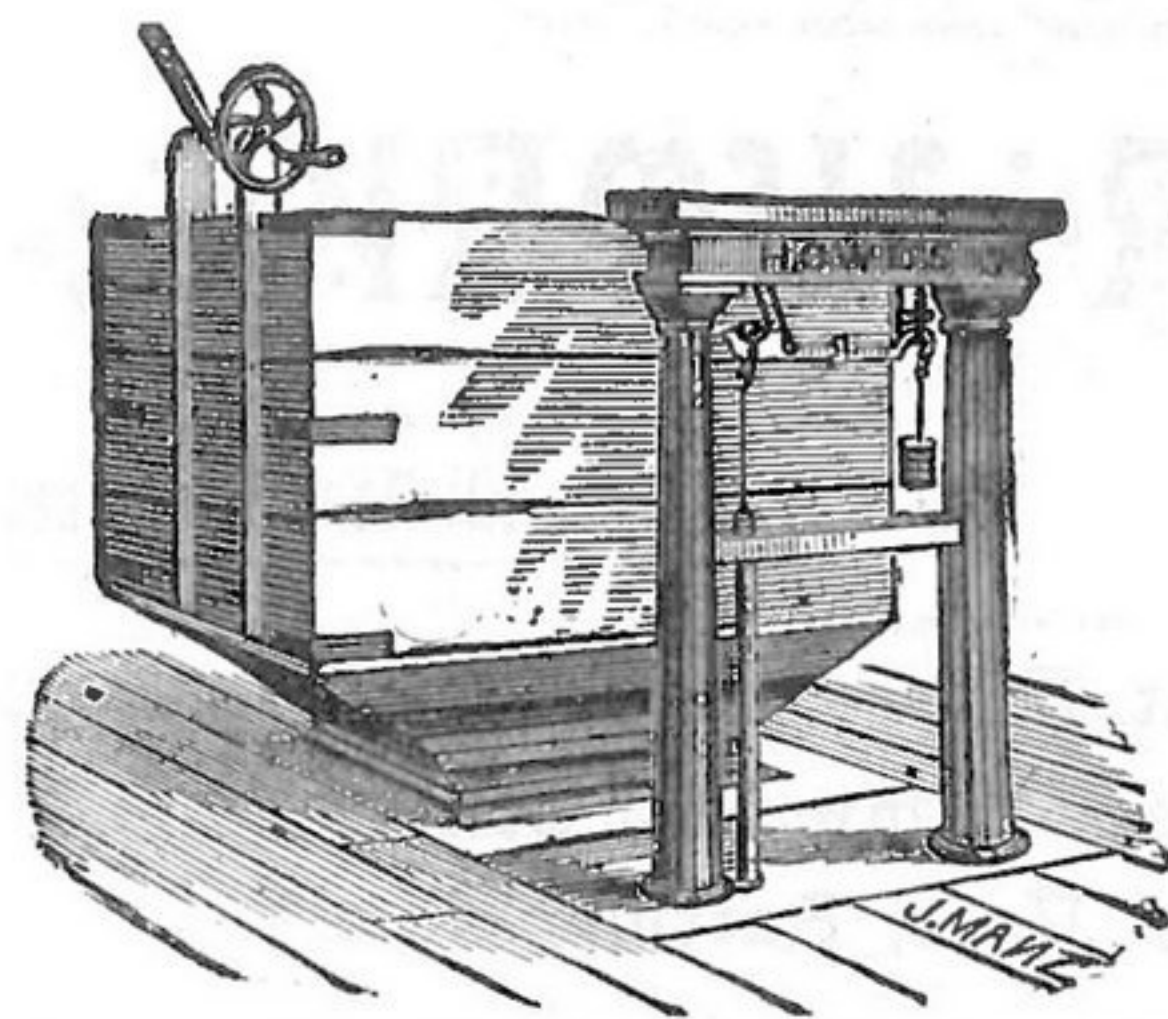
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This Belting is made up with the usual plies of Duck and Rubber, and, before putting on the outside cover, it is STITCHED in seams one inch apart with cotton cord, which has a pulling strength of fifty pounds. It is then STRETCHED in its plastic state, drawing the plies so close together that with the strong cord with which it is stitched, material strength is added to the belt, and the stitches are so drawn into the plastic rubber that they cannot wear off on the outside. The outside cover is then put on SEAMLESS, so that it cannot open, as is the case with Rubber Belting made in the ordinary way, and the plies being so firmly stitched, as well as frictioned together, that the belt cannot separate, as many belts made in the old way will after being used for a time, especially when run at great speed or in damp places.

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Motive Power and Entire Equipment of a Modern Mill Furnished under one Contract.

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Yours, &c.,

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D. S. & CO.

Letters on file in our office from a large number of small roller millers giving as favorable reports as above. A portion will be published as occasion demands.

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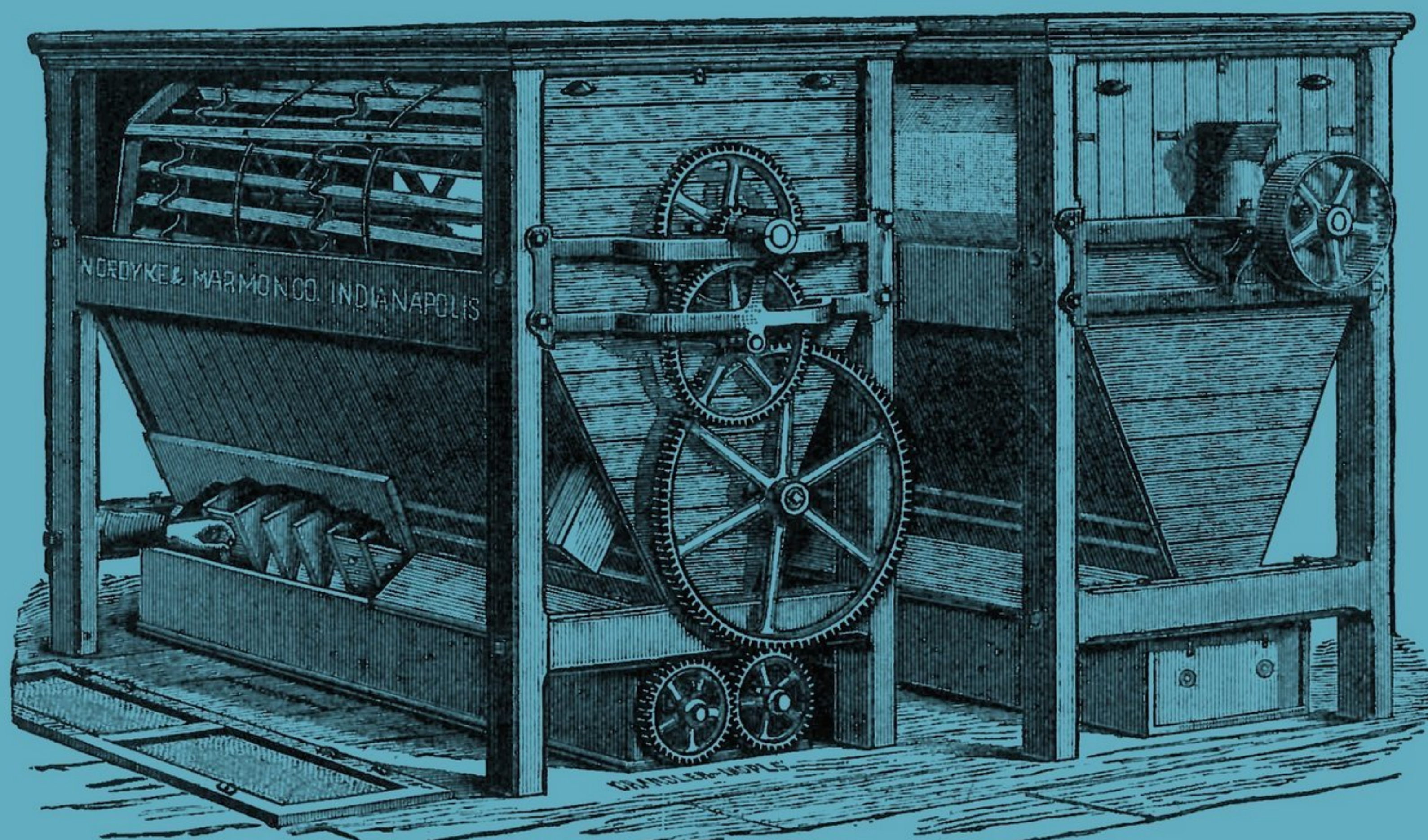
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A MODEL OF SIMPLICITY

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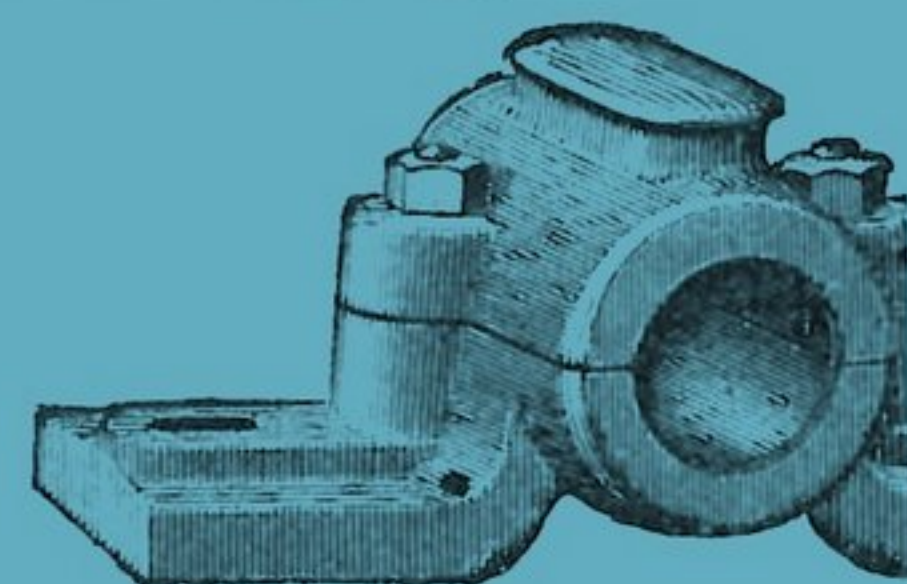
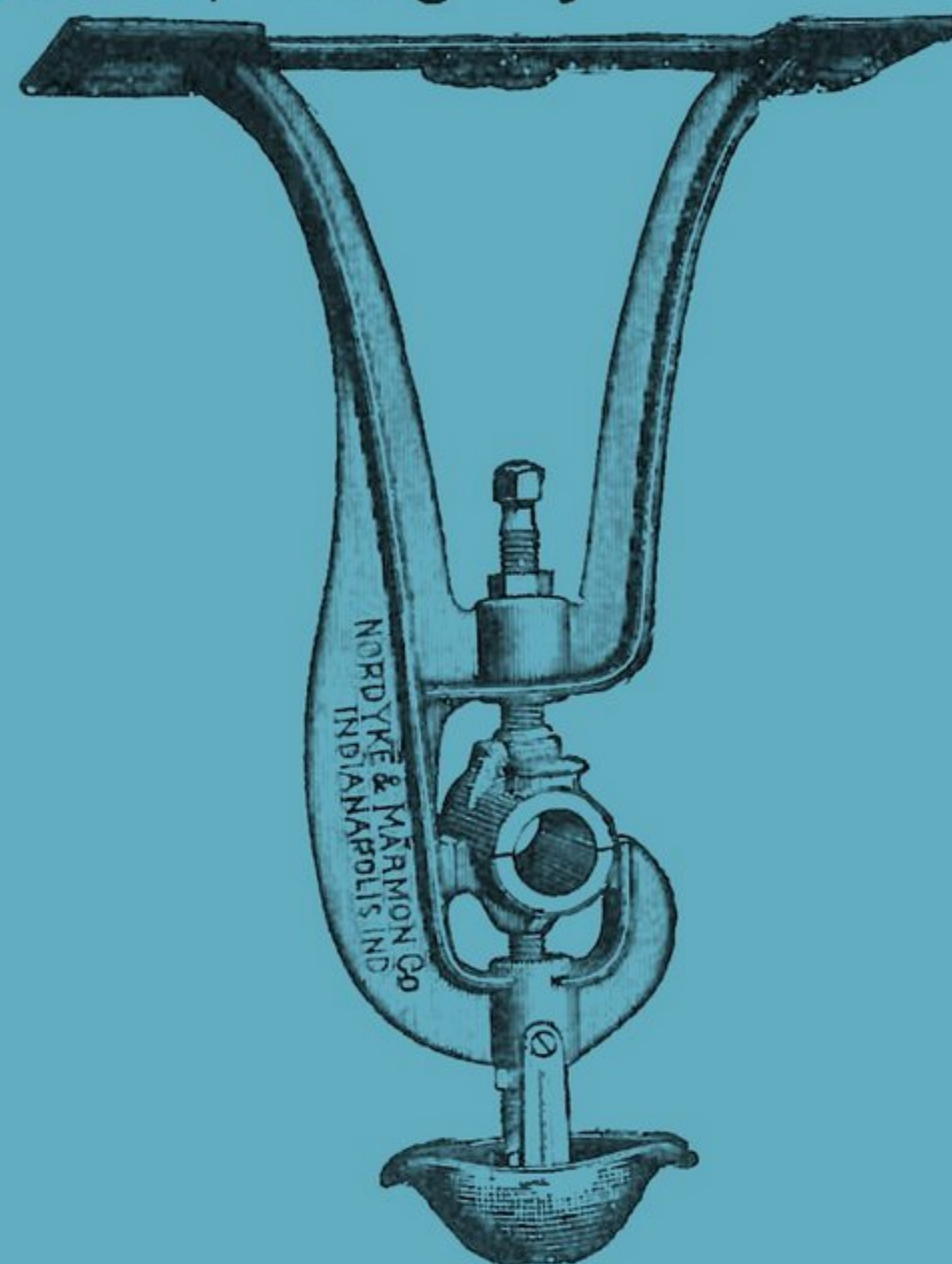
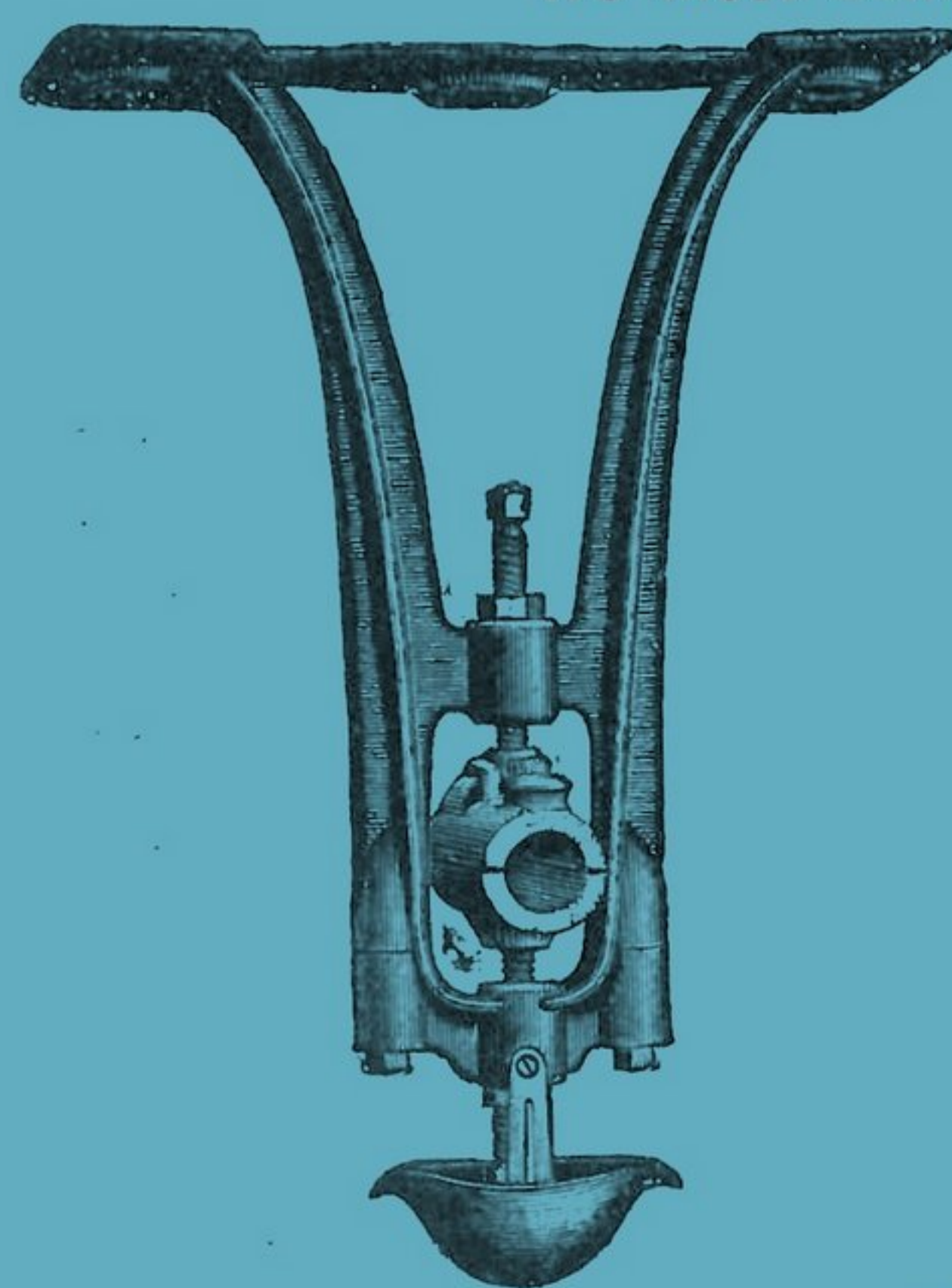
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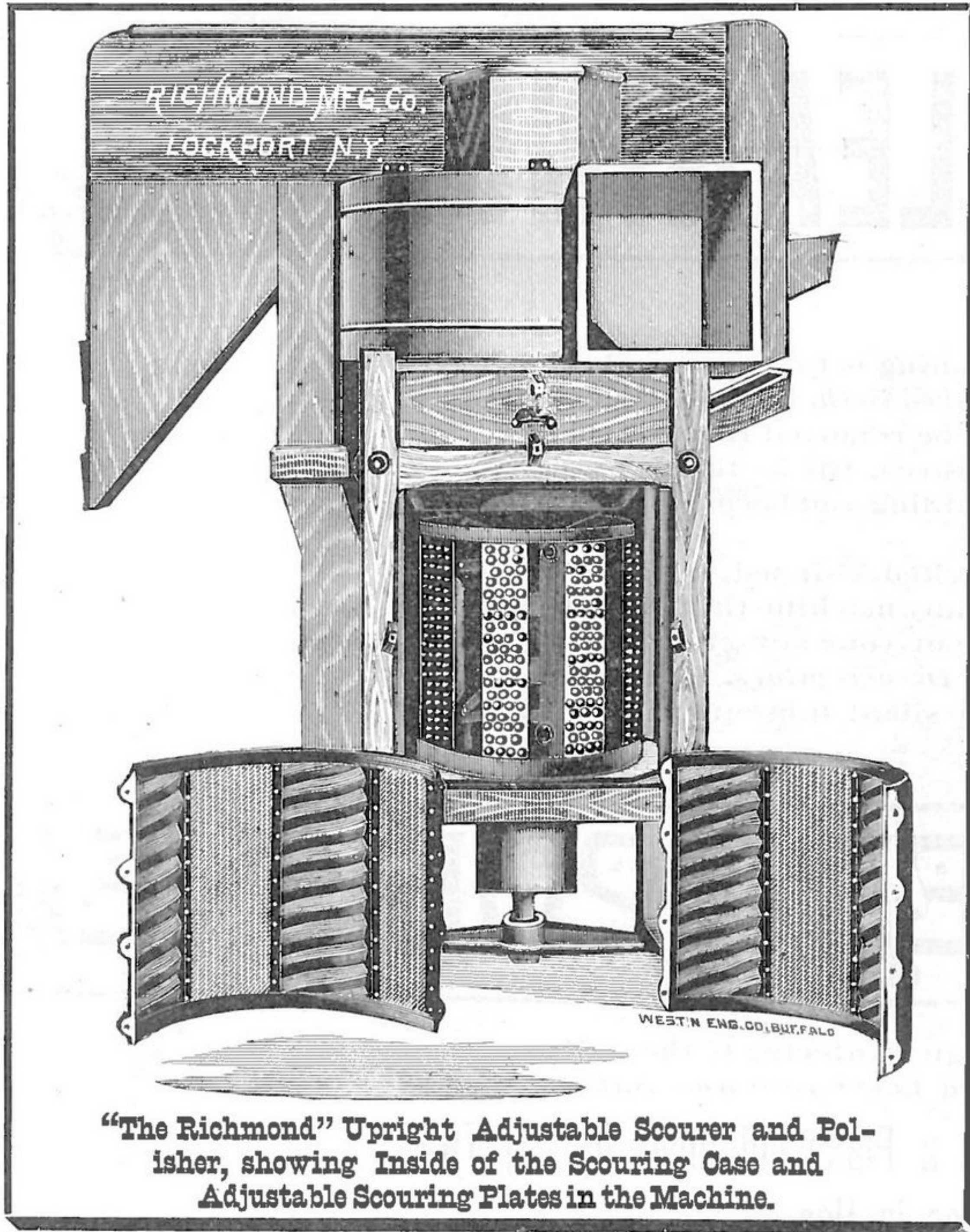
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Upright and Horizontal Bran Dusters,

Centrifugal Flour Dressing Machine

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BARNARD'S DUSTLESS WHEAT SEPARATOR

Has maintained its superiority over all other separators, and is to-day acknowledged by the best millers of all countries

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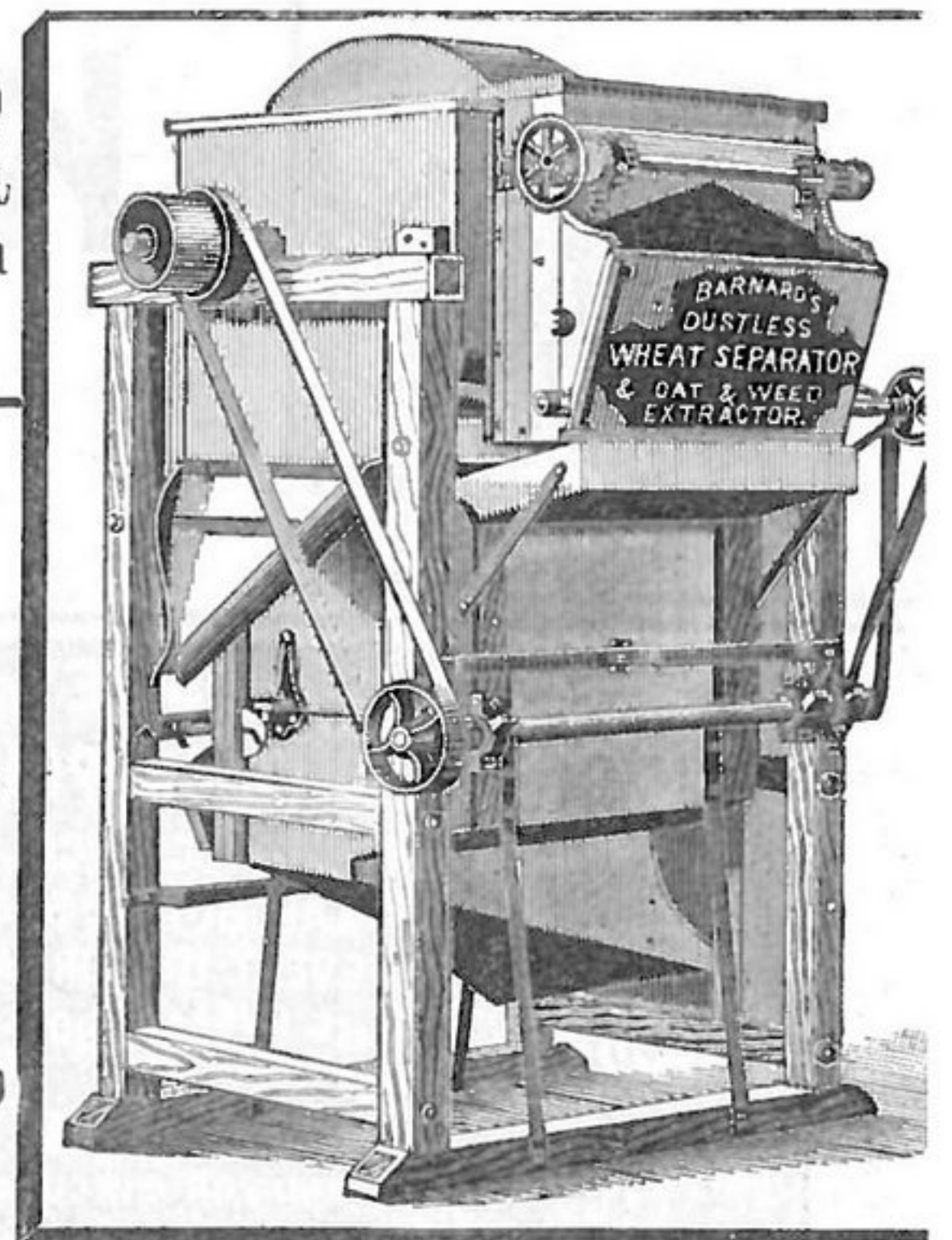
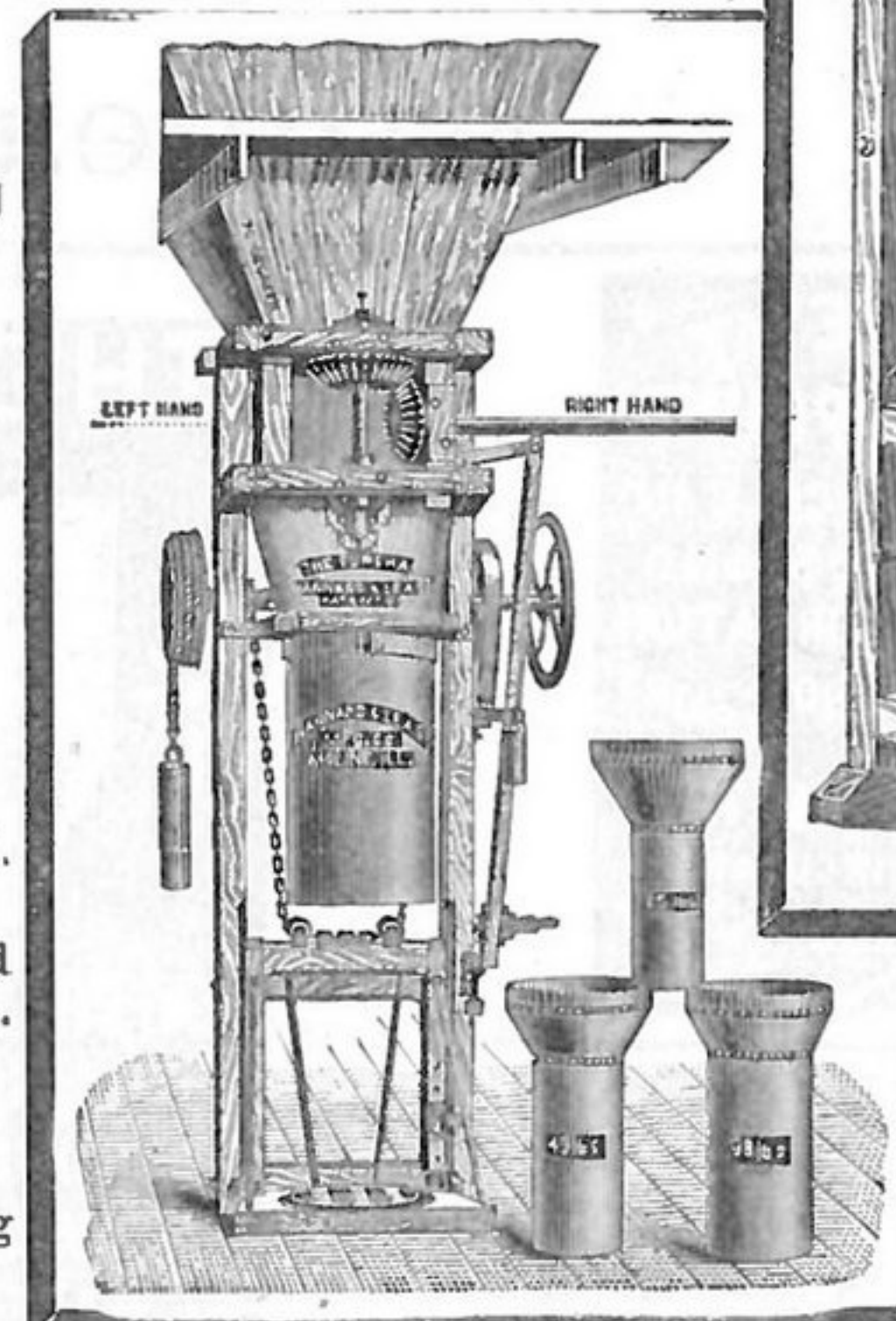
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CH. WALCOTT & CO. SOLE MANUFACTURERS
INDIANAPOLIS, IND.

BELTING,
BUCKETS,
Etc.

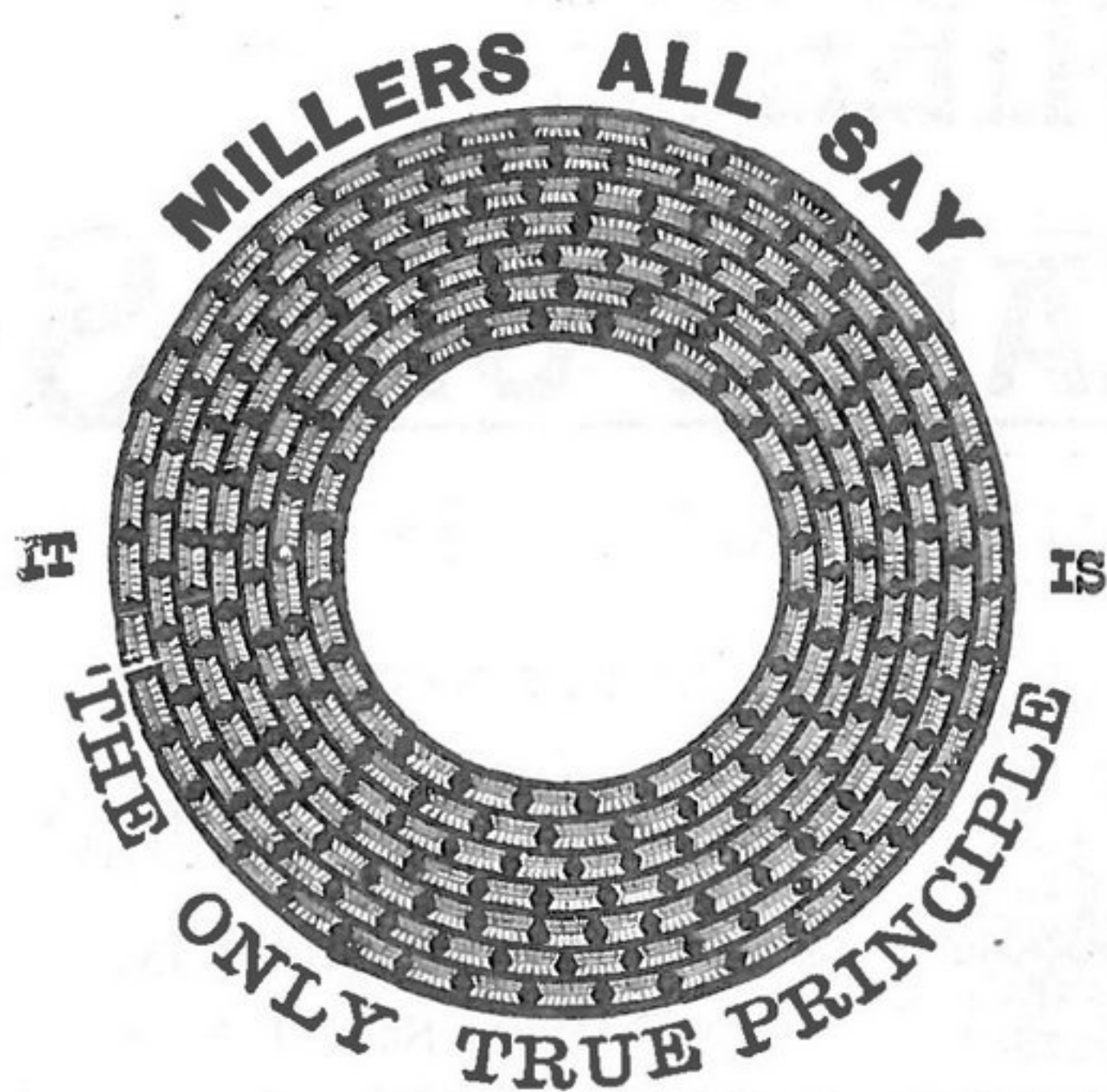
SMITH BROS. & CO., MILL FURNISHERS,

Patented Sept. 5, 1882.

And Sole Manufacturers of the

Patented June 12, 1883.

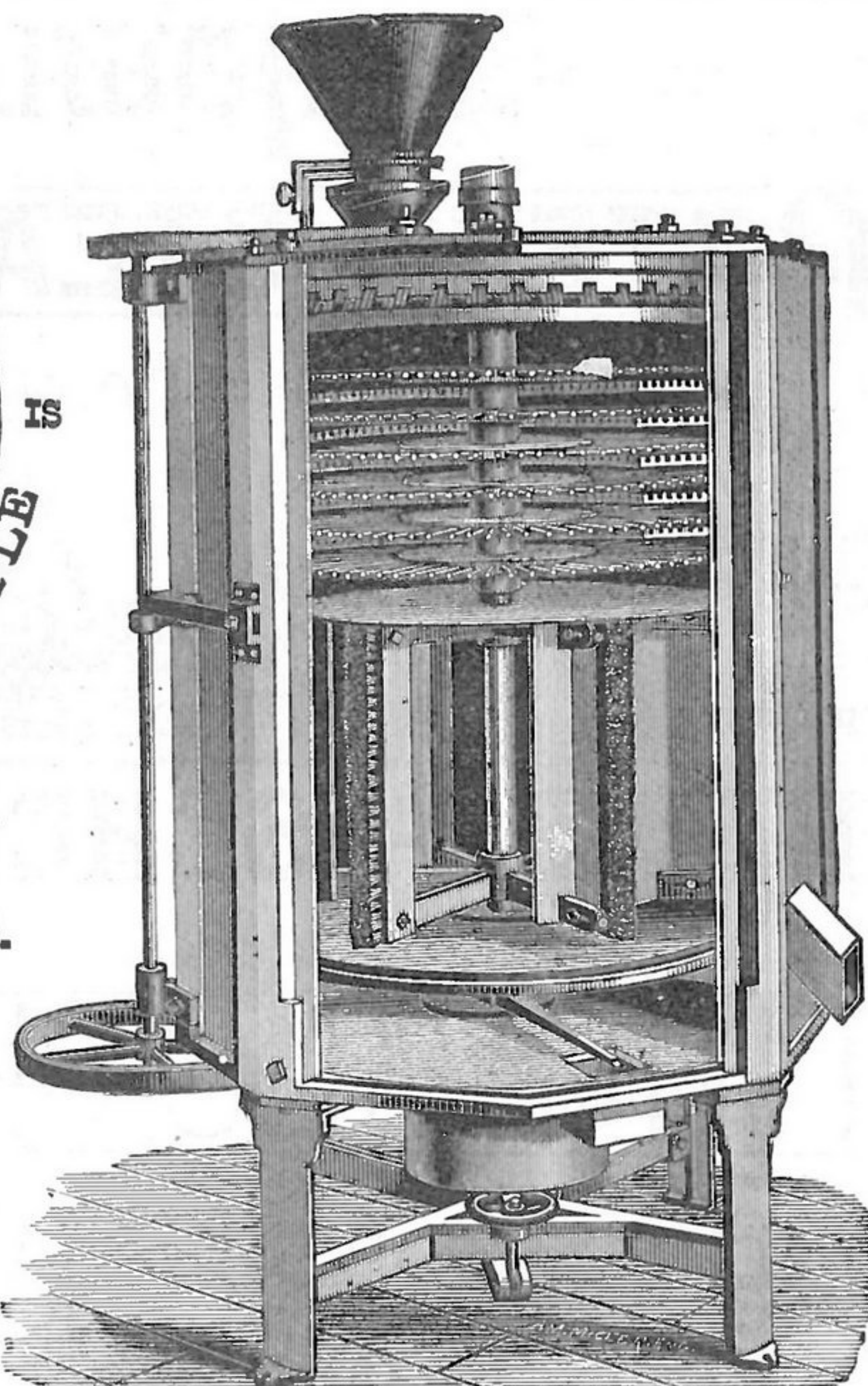
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TO CLEAN BRAN
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UNFINISHED MIDDINGS.

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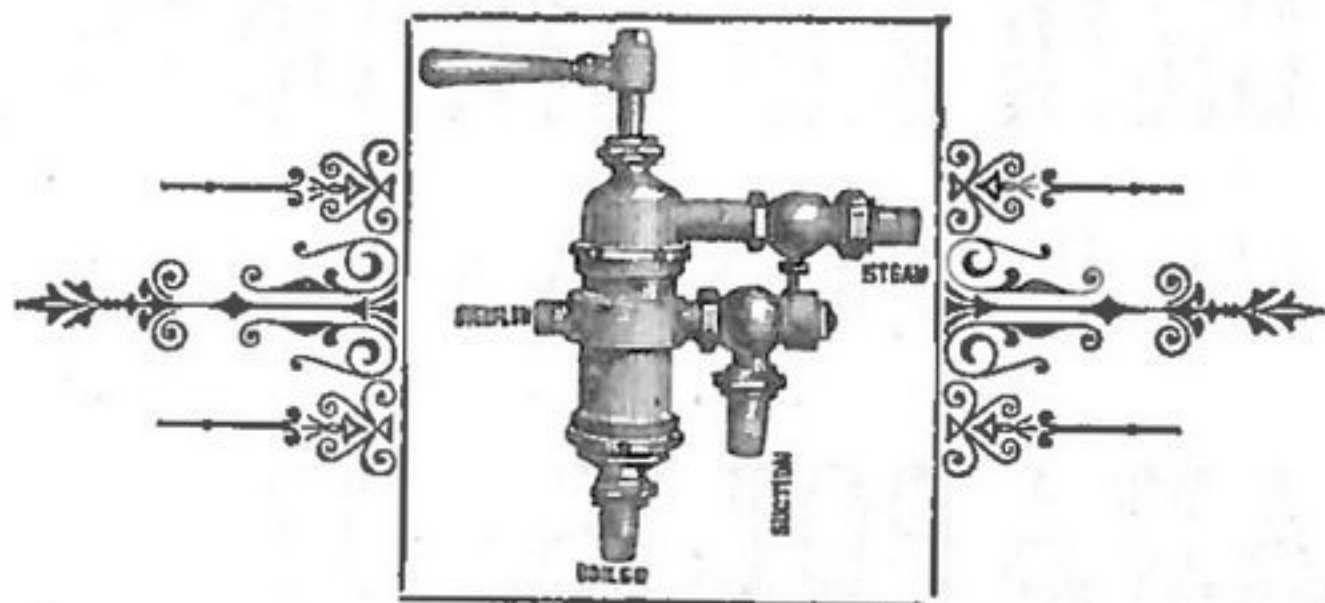
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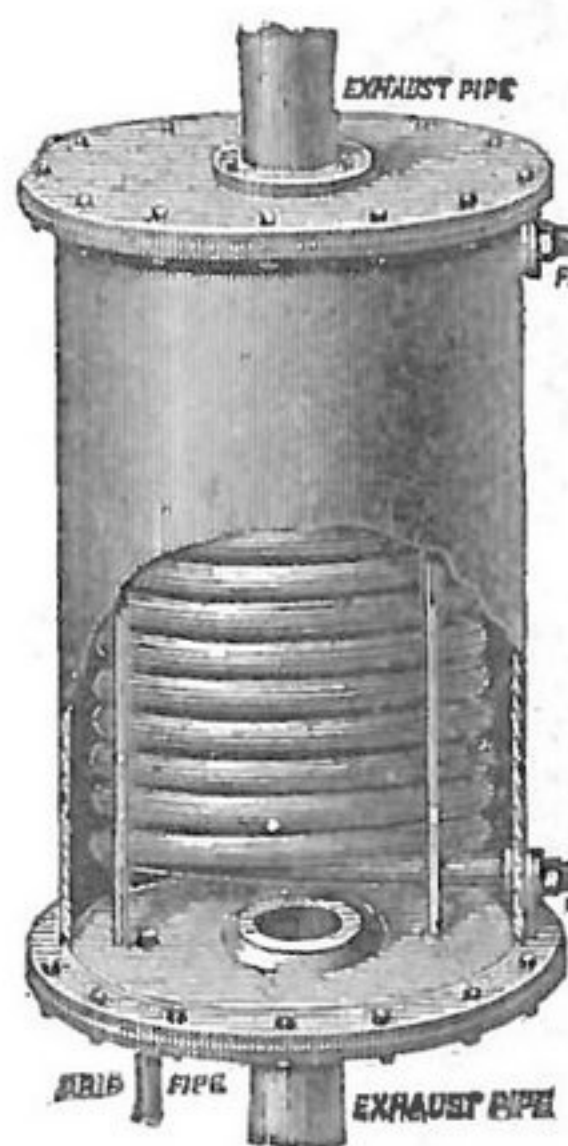


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A brass coil heater sup-
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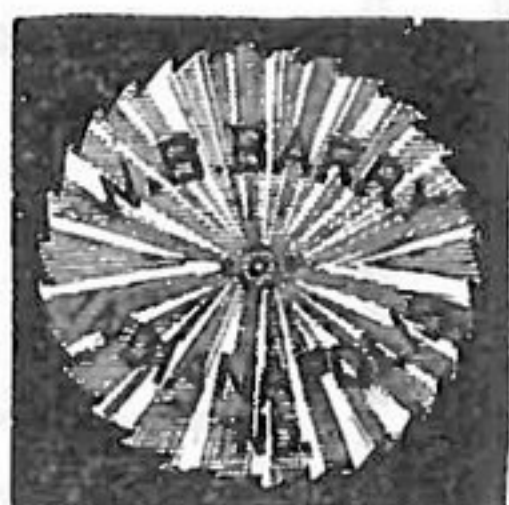


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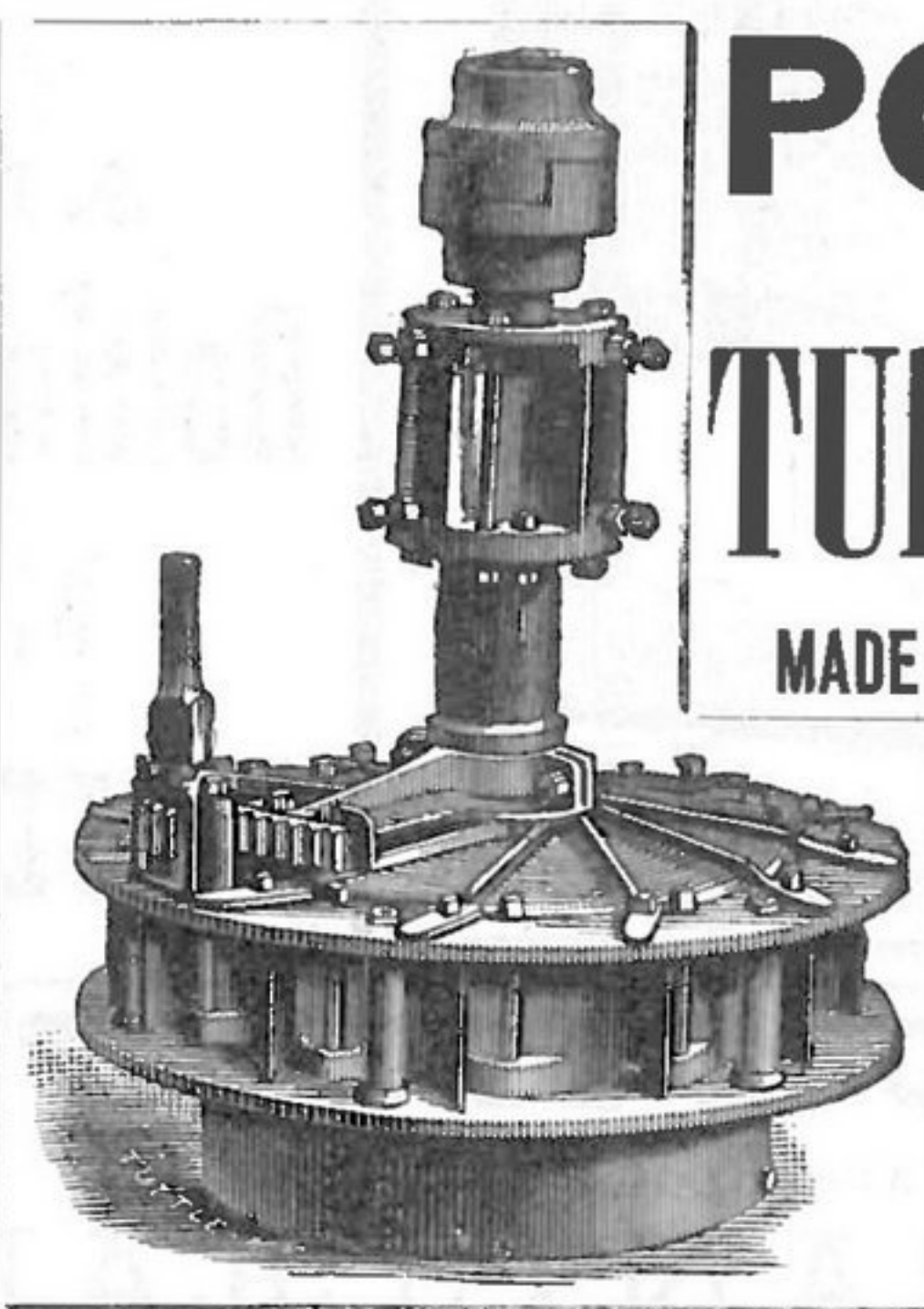


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From 1 to 20 feet diameter, of any desired face or pitch, mou-
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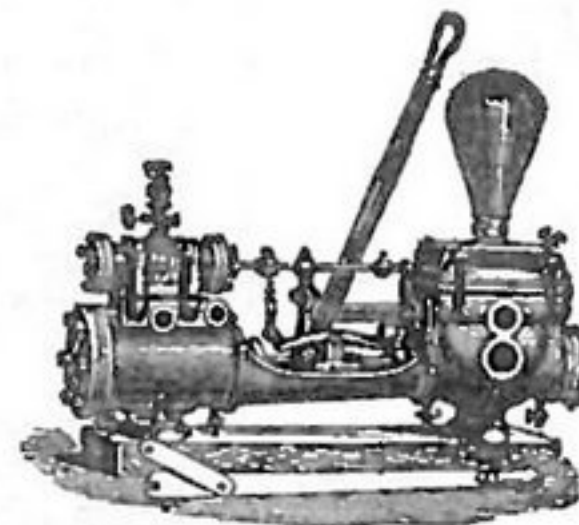
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Boiler Feed Pumps, Fire
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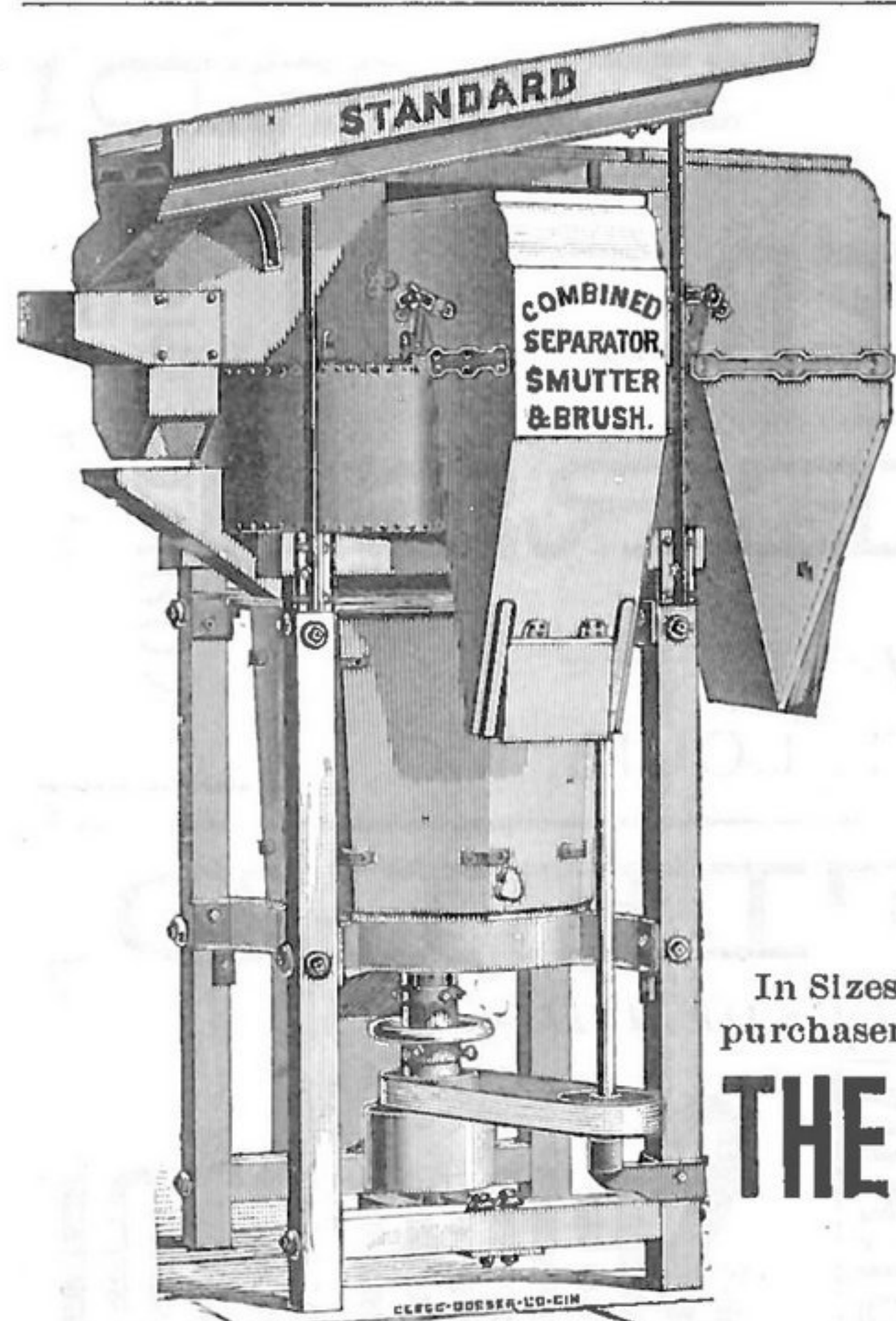
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In Sizes suitable for Mills of any capacity. These Machines are sent to Responsible Parties on thirty days' trial, the purchaser to be the judge. We Guarantee every Machine. Send for Illustrated Catalogue and Price List.

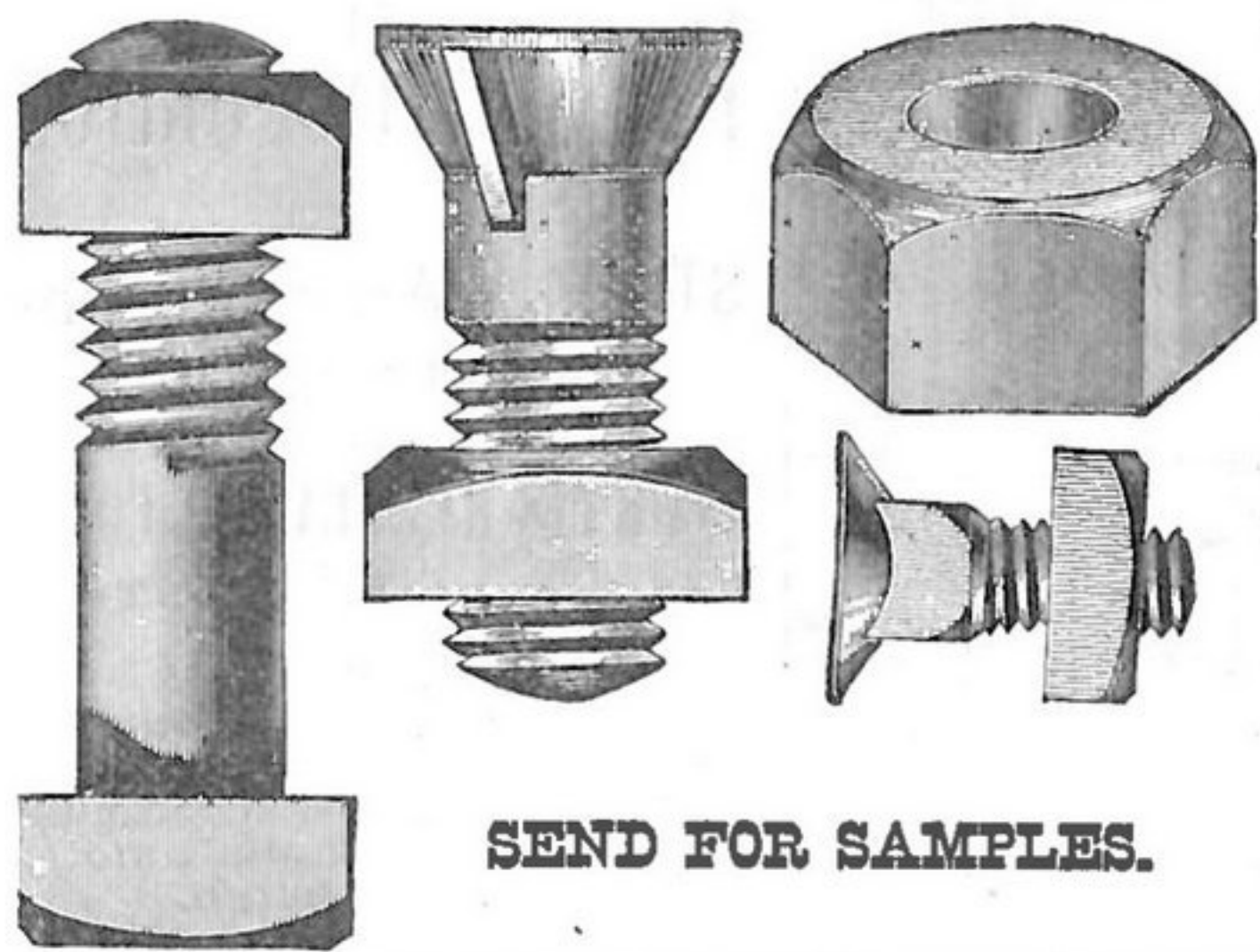
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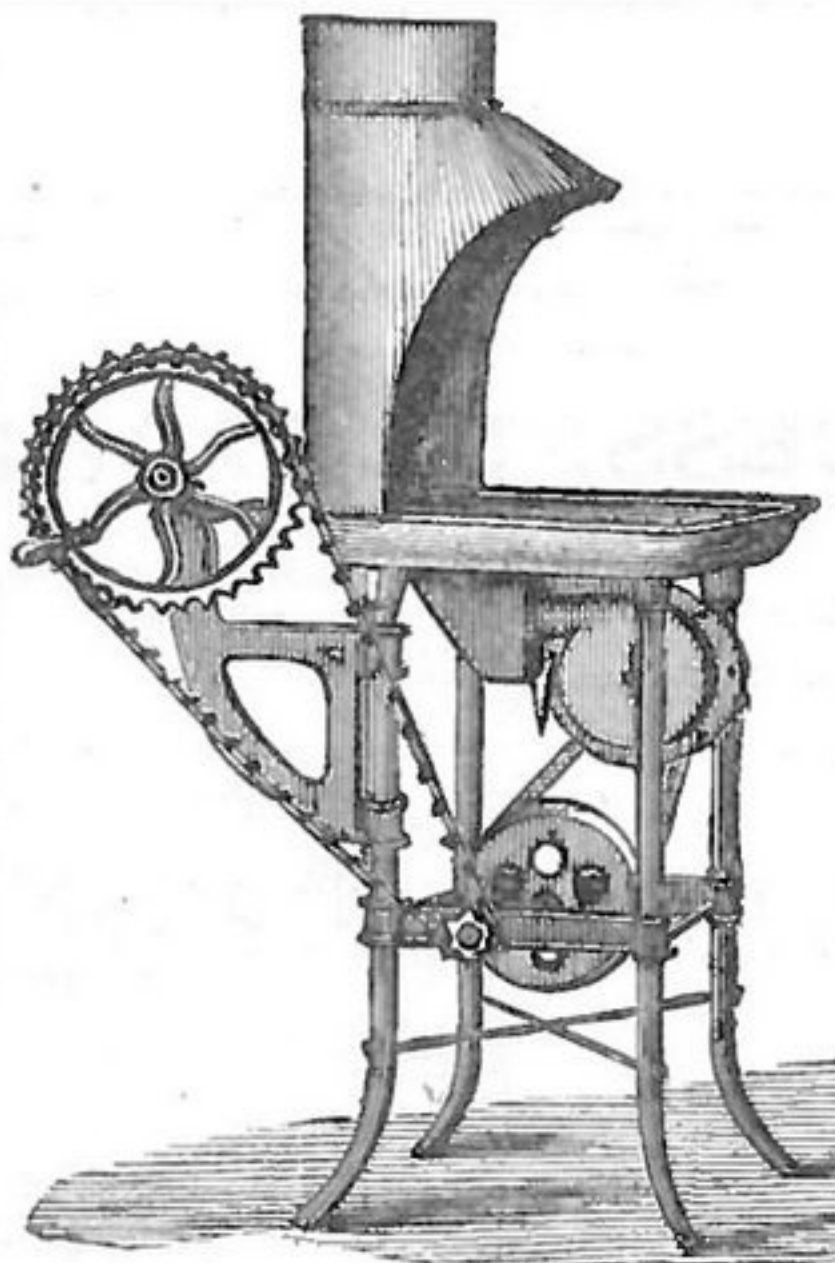
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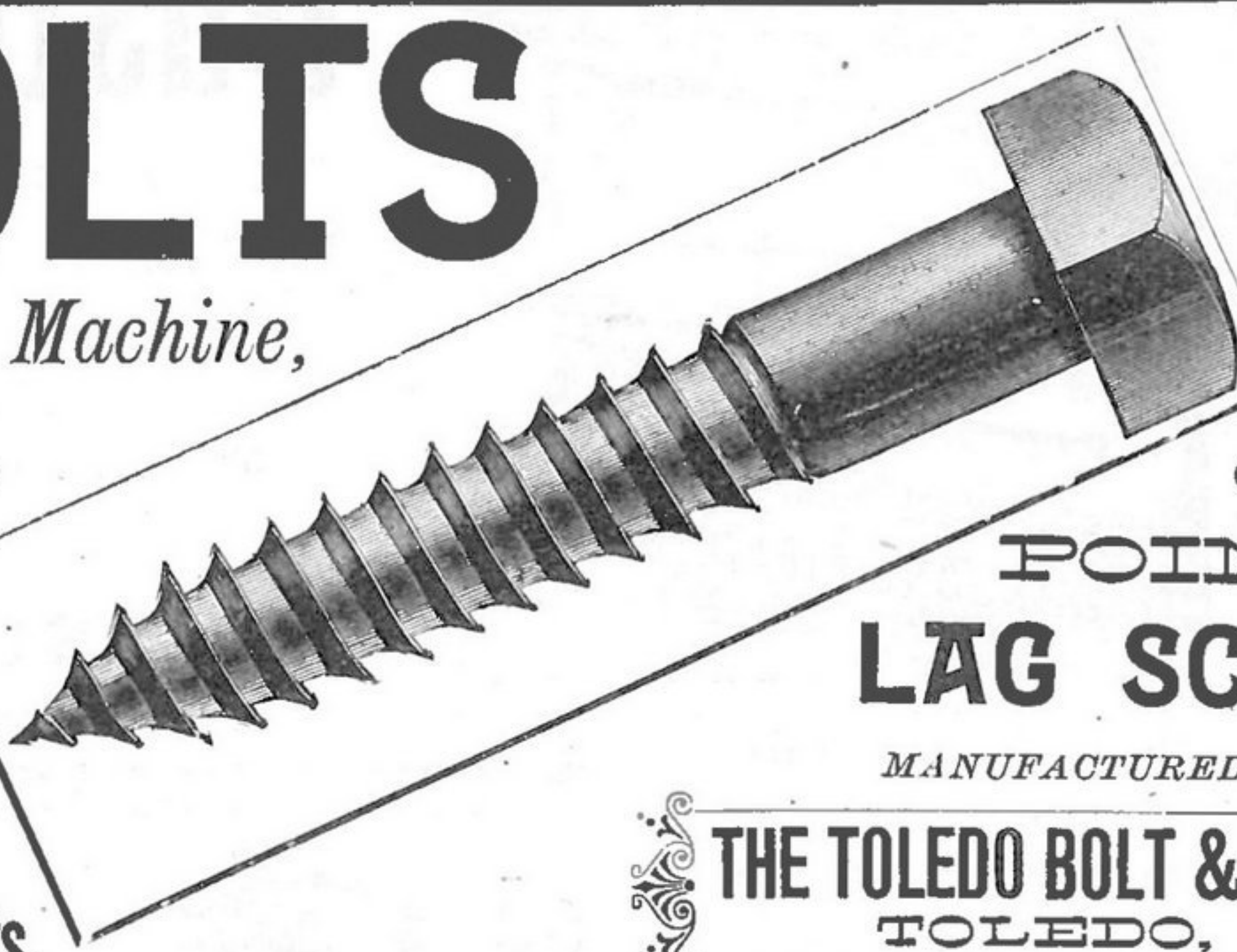
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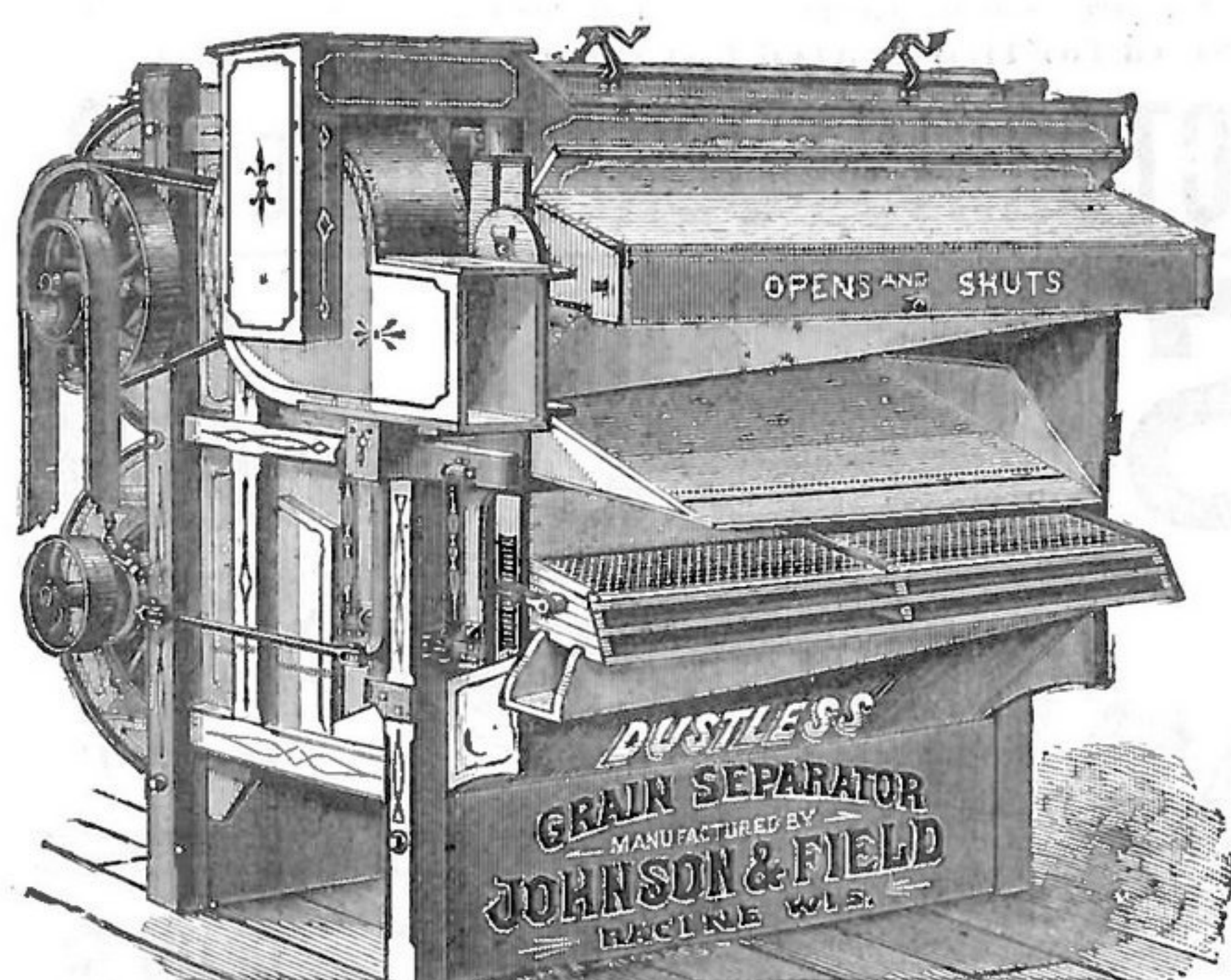
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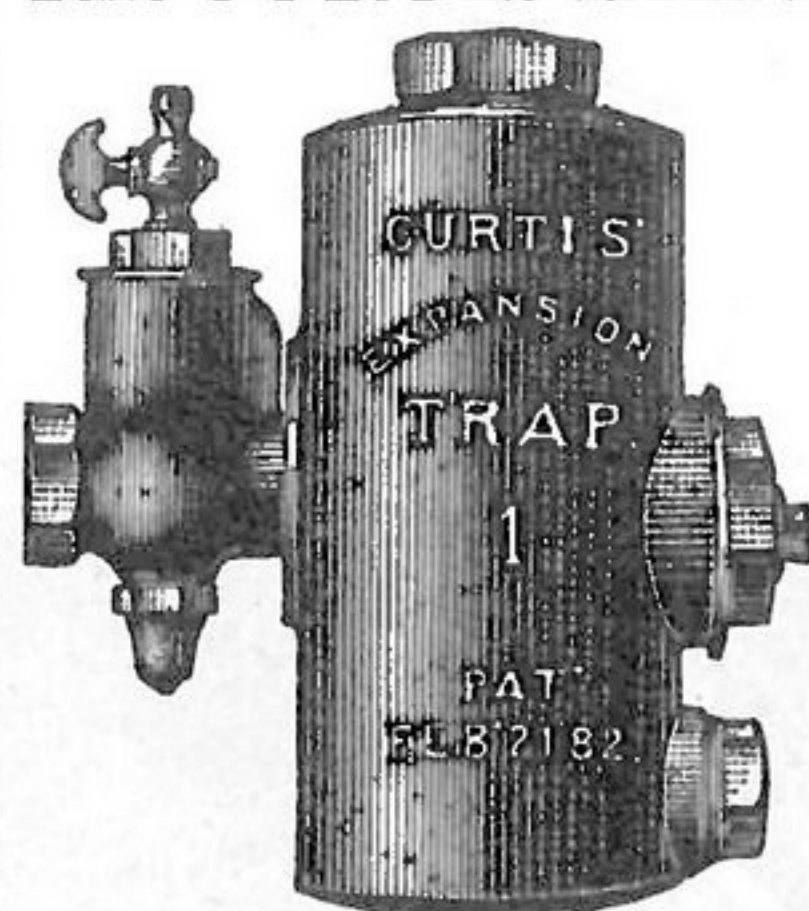


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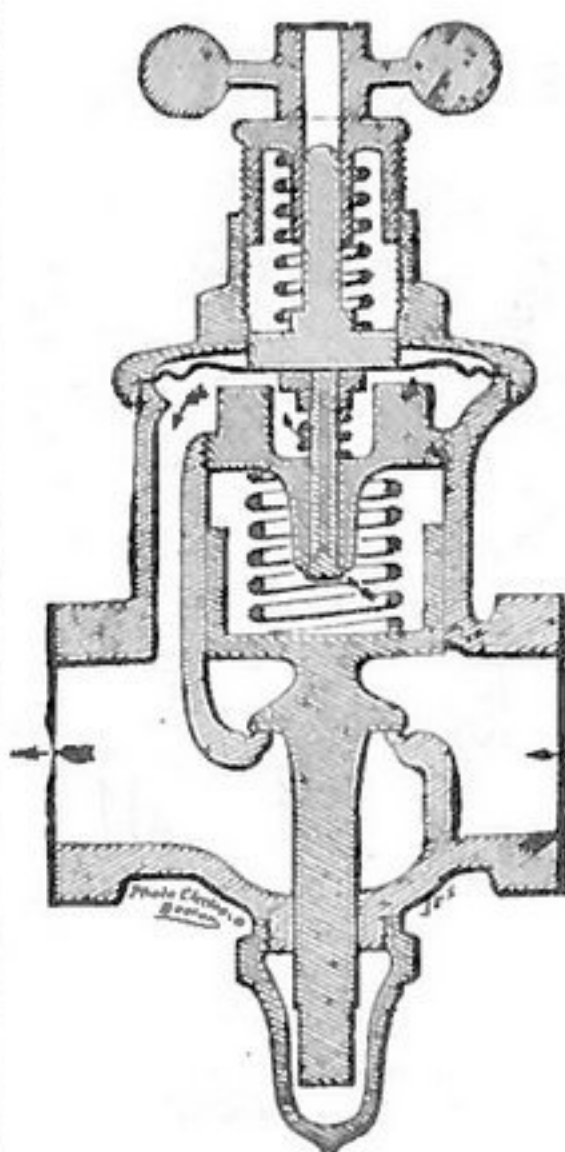
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Discharges air as freely as water.

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STEAM, WATER AND

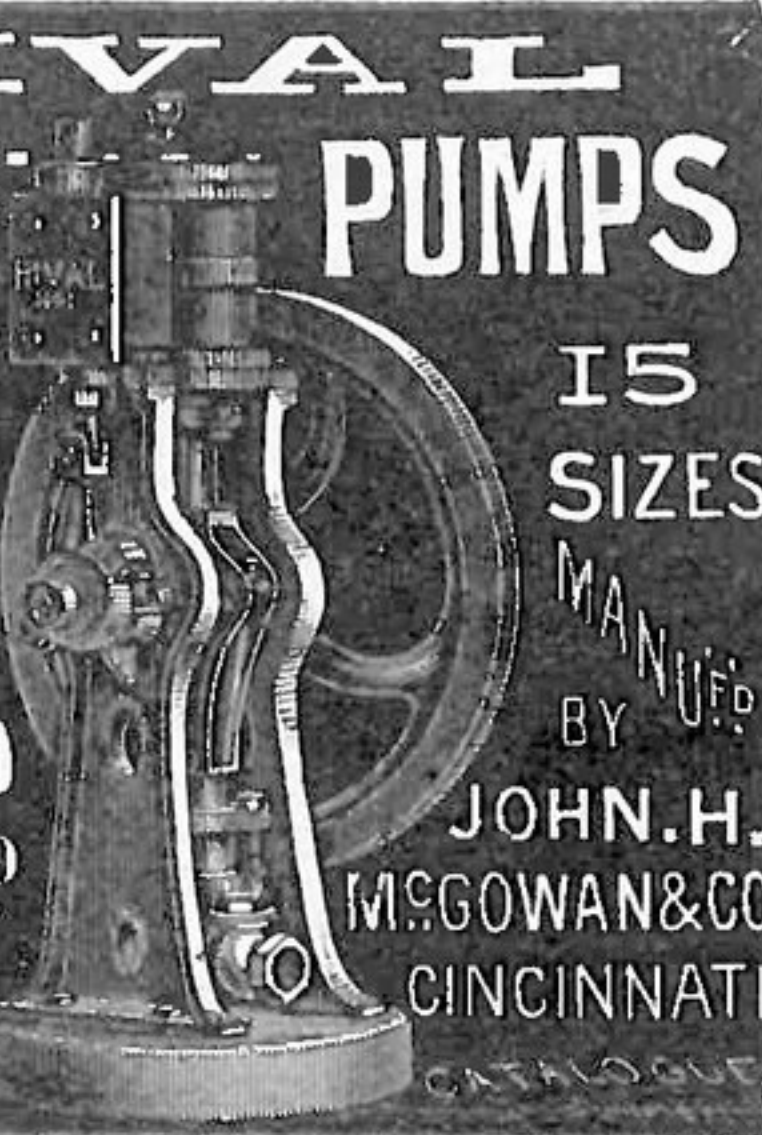
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CHEAPEST
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FOR
HOT & COLD
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\$35.00
AND
UPWARDS.



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CINCINNATI

Belting and Mill Supplies.

J. R. RYAN & CO.,
—GENERAL—

Commission Merchants,
Flour, Grain, Feed, Hay, Etc.

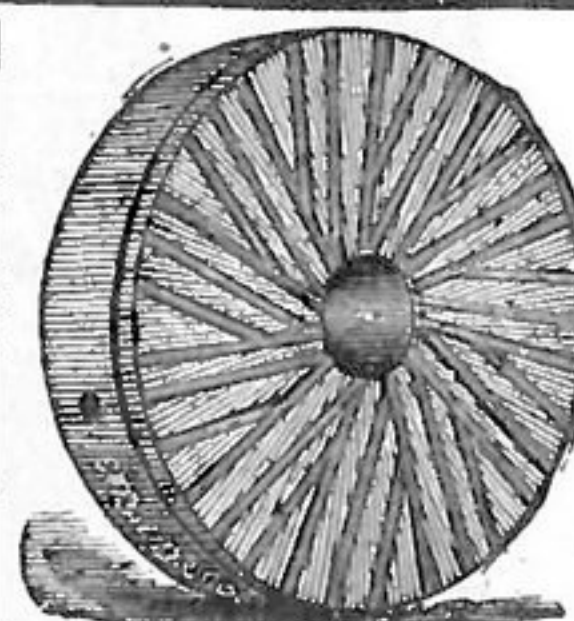
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To 1884.

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SIMPSON & GAULT
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HAVE MADE
Flour Mill Machinery
—SINCE—
CINCINNATI

From 1844

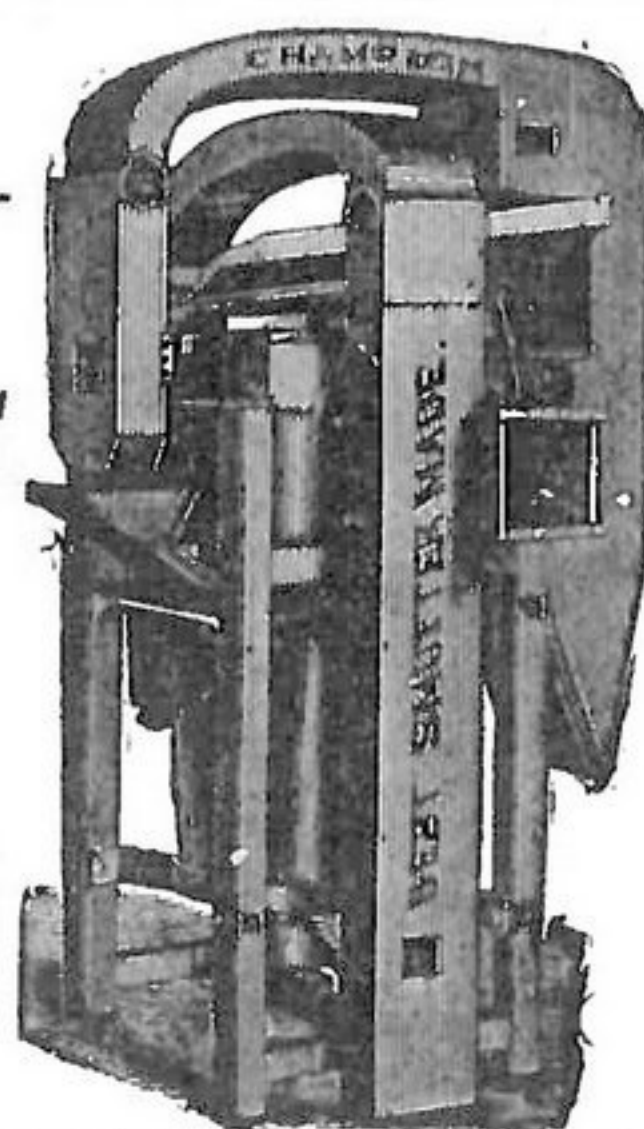


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Needed in a Flour Mill.

WRITE US.

40 YEARS
—OF—
SUCCESSFUL WORK.

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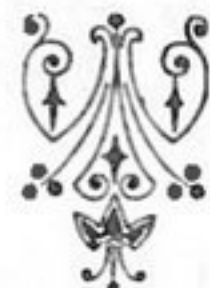
THE V, OR ANGULAR BELT.

Of which we are the sole manufacturers under letters patent of the United States. This belt is especially recommended where steady and reliable motion in power is needed. It gives more power from the contact surface of belt and pulley than any other belt made. Less friction on bearings. Less space than flat belts.

PATENT TWO-PLY FLAT BELT.

An entirely new departure in the belting line. It will not crack; has less stretch than any other, and is of uniform thickness.

For severe service surpasses all others.



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(SEE CUT.)

We are sole manufacturers of this belt. It is made in sizes from 5-16 to 1 inch, from the best Oak-Tanned Leather. The outside plies are without joints, the whole securely fastened by the standard screw. It is round, very strong, durable and without stretch.

Fig. 2

Fig. 1.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 1 shows a section of belt unscrewed from our new-style coupling.

Fig. 2 shows the different sizes grouped together, from 1-16 to 1 inch.

Fig. 3 shows Belt coupled together with steel Hook and Eye coupling.

Fig. 4 shows a section of belt cut in halves—manner of fastening together with Standard screws.

Fig. 5 shows an endless belt as made by us. The most perfect thing out; made any length desired.

THE PATENT COTTON-LEATHER BELT.

This belt is the greatest thing in the line of Belting ever offered to manufacturers in this country. The body of the belt is one continuous belt, without laps or joints of any kind. The driving surface of this belt has no rivet, slacing, or stitching to wear out or detract from its contact surface. Especially adapted to all kinds of rapid running machinery. For

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We are also manufacturers of

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Write for our pamphlets and price lists.

See our name and address on tag in above cut.

IMPROVED SUCCESS!



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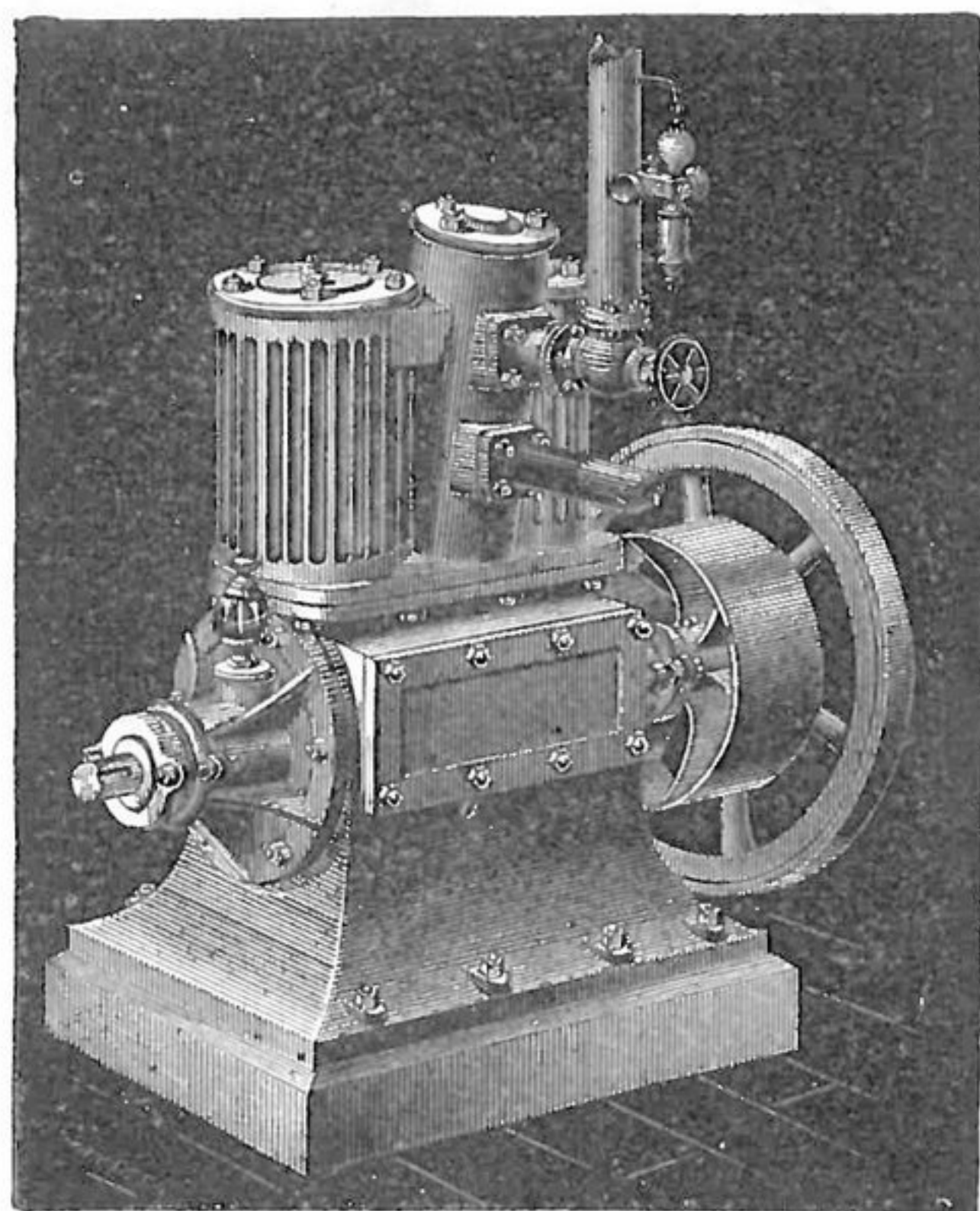
Full Gate.....	86.29
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This Wheel is durable and cheap.

Send for Pamphlet to

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[Rear View with one fly wheel removed.]

Over 600 Engines now in Use, Aggregating 16,000 Horse Power.

The Westinghouse Automatic Engine has no equal in SENSITIVE AND CLOSE REGULATION, LOW COST OF MAINTENANCE, AND GENERAL CONVENIENCE and in all other features of a First-class Engine it is guaranteed to have no superior.

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Especially Adapted to Coupling Direct to Jack-Shaft, or to Special Machinery.

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FACTORY.

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I handle nothing but MILL PICKS. Send for Price List with reference.

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Needs no Penstock and Saves its Cost.

ITS VIRTUES AND WHAT WE GUARANTEE:

*Highest Efficiency. Never Wears Out.
Tight Gate. Never out of Order.
No Clogging. Needs no Penstock.*

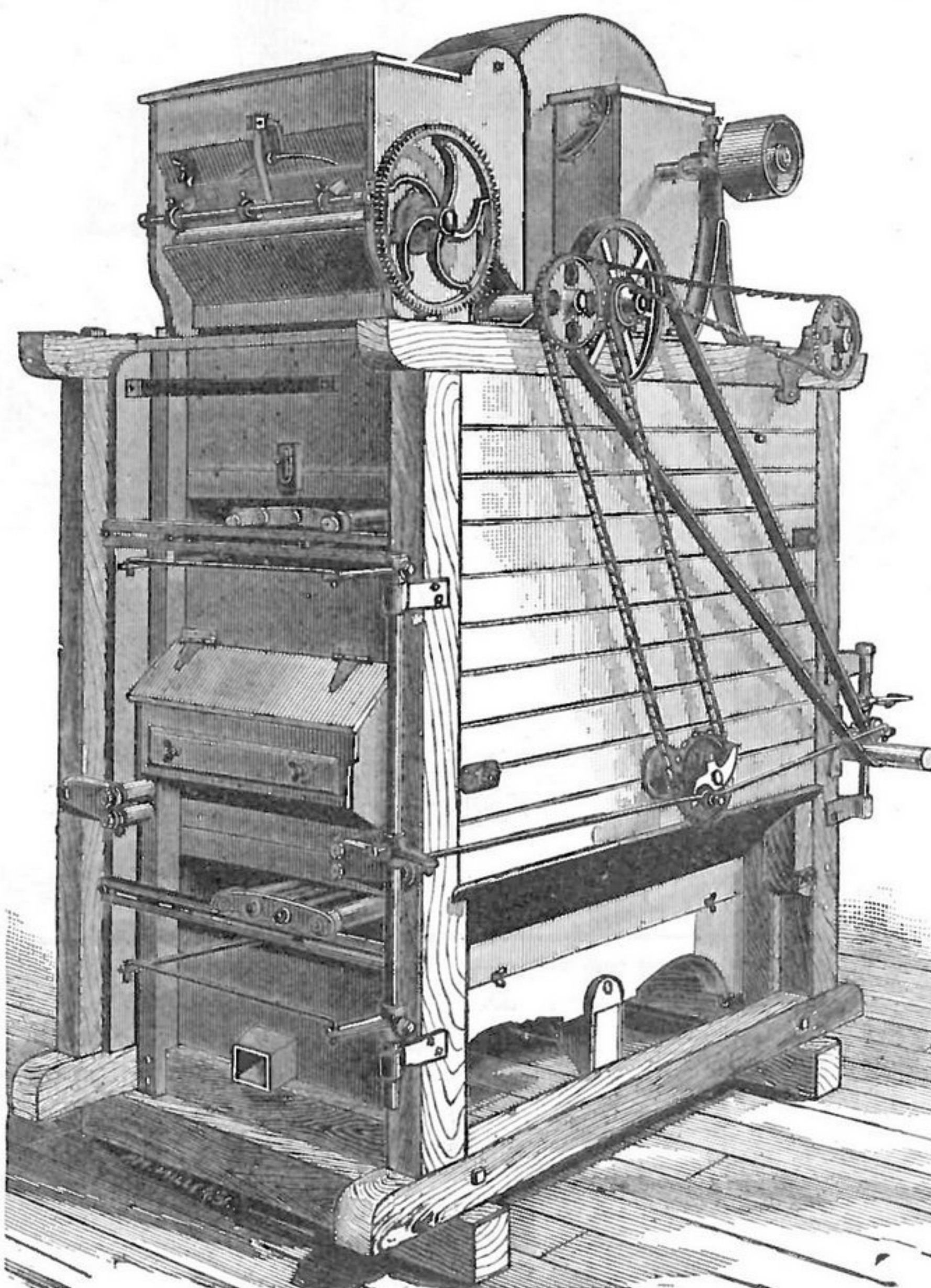


It will pay every mill-owner contemplating a new water wheel to send for our new illustrated wheel book.

Hundreds of wheels in use in the largest mills in the world. Send for circulars.

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Guaranteed Licensed UNDER ALL Conflicting Patents.

The Automatic Separation Feeder.—The process of taking out the heavy Specks between each number of cloth. The settling of the heavy dust, and lifting the light into the dust room.

THIS IS THE SMALLEST MACHINE IN THE WORLD, BY FAR.

WITH COLLINS' AUTOMATIC CLOTH CLEANER.
This Purifier has the following features which are secured to it by patent, and which no other Purifier can use.

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The Great Point of Excellence, *Excluding the Air at both ends of the Reel*, when necessary, now so poorly imitated by many machines, is one of the original features of the

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IT HAS

The **BEST PRELIMINARY DISINTEGRATOR** for rejecting all foreign substances.

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The **CONCAVE FEED DISTRIBUTOR**, which greatly increases the capacity of the Machine.

The **MOST CONVENIENT MANNER** for putting on cloth.

The best **MATERIAL** and **WORKMANSHIP** in its construction.

All these and the many nice mechanical details peculiar to our goods have gained for the **SILVER CREEK CENTRIFUGAL**

ITS PRESENT GREAT POPULARITY.

FULLY PROTECTED
By the Foundation Patents on this class of Machines, which are
OUR EXCLUSIVE PROPERTY.

We have also added an
ADJUSTABLE BRUSH
Which can be used more or less,
AS CIRCUMSTANCES REQUIRE.

We have recently so changed its construction that by raising the cloth from the ribs and supporting it on the annular bands, we get a *Continuous Cloth Surface*, and so greatly increase the working capacity.

We have entirely overcome the great objection to chain belt by our adjustable bearing, which enables us to *adjust the strain on the chain to any desired tension.*

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WE GUARANTEE OUR CENTRIFUGAL TO DO ALL THAT CAN BE DONE ON ANY CENTRIFUGAL, AND

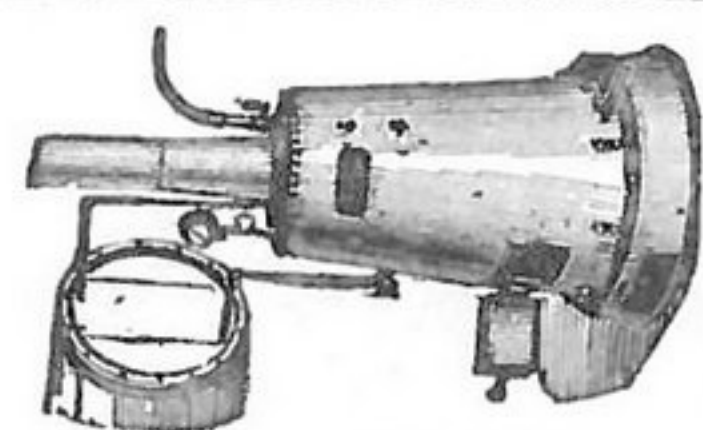
To Have the Greatest Capacity of any Centrifugal in the Market.

See our Greatly Reduced Price List.

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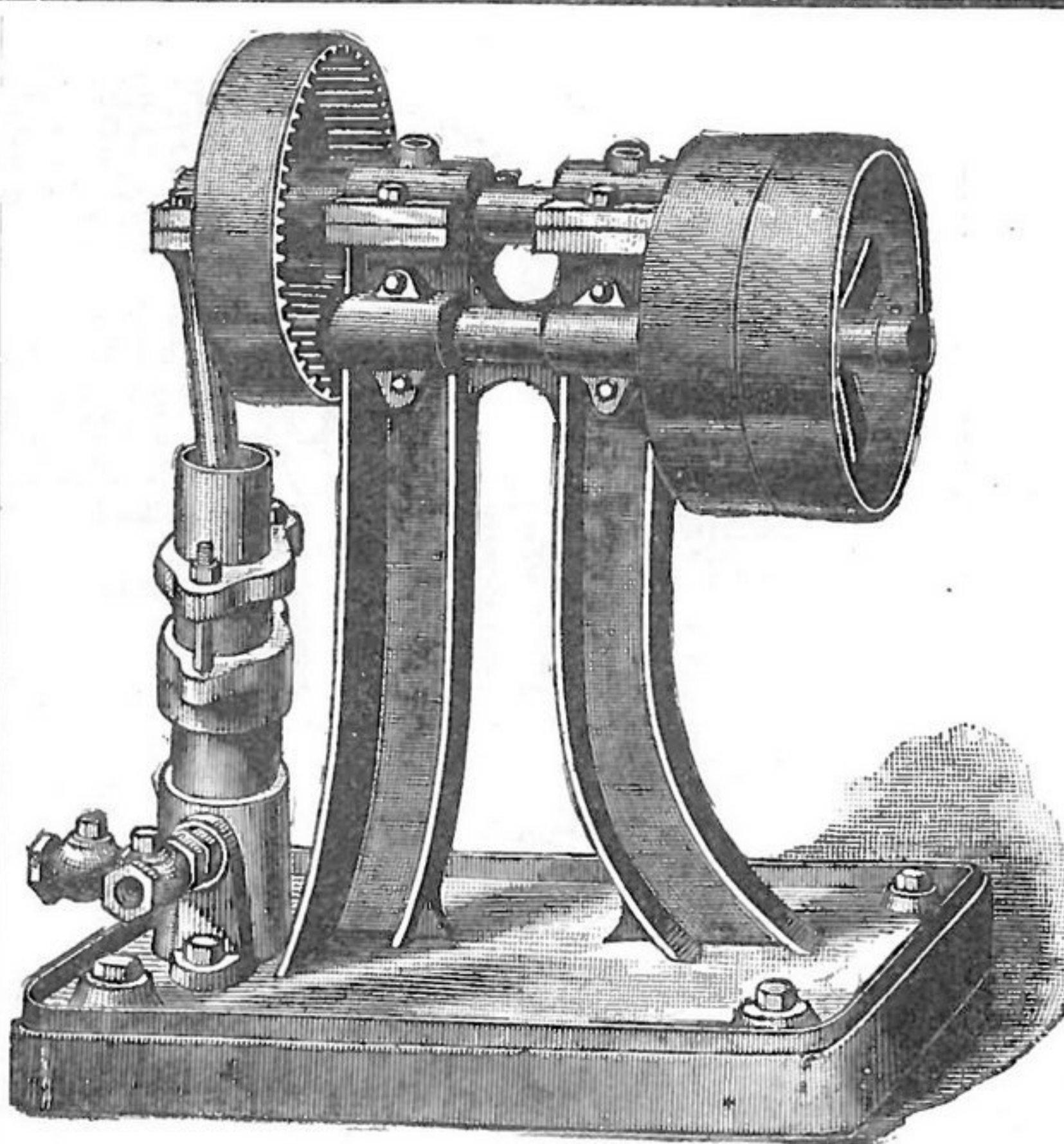
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JOHN A. M. COX, Proprietor.
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Spiral Chimneys and Breaching, Patent Sorghum Pans, Tanks, Gasometers, Tar Kettles, Elevator Buckets, Grain Conveyors, Shovels, Doors, Shutters, Window Guards, Architectural Iron Work, and all kinds of Black Sheet and Galvanized Iron Work. Special attention to Repair work, and building sheet iron Furnaces and Economy Stove Drums.

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STRONG, CHEAP AND DURABLE.

NUMBER THREE:

2 3/4 inch Plunger, 4 3/4 inch Stroke, 1 1/4 inch Suction, 1 inch Outlet; capacity, 60 H. P. Boiler, down; price, with Check Valves, complete, \$30. Full particulars regarding speed, etc., on application.

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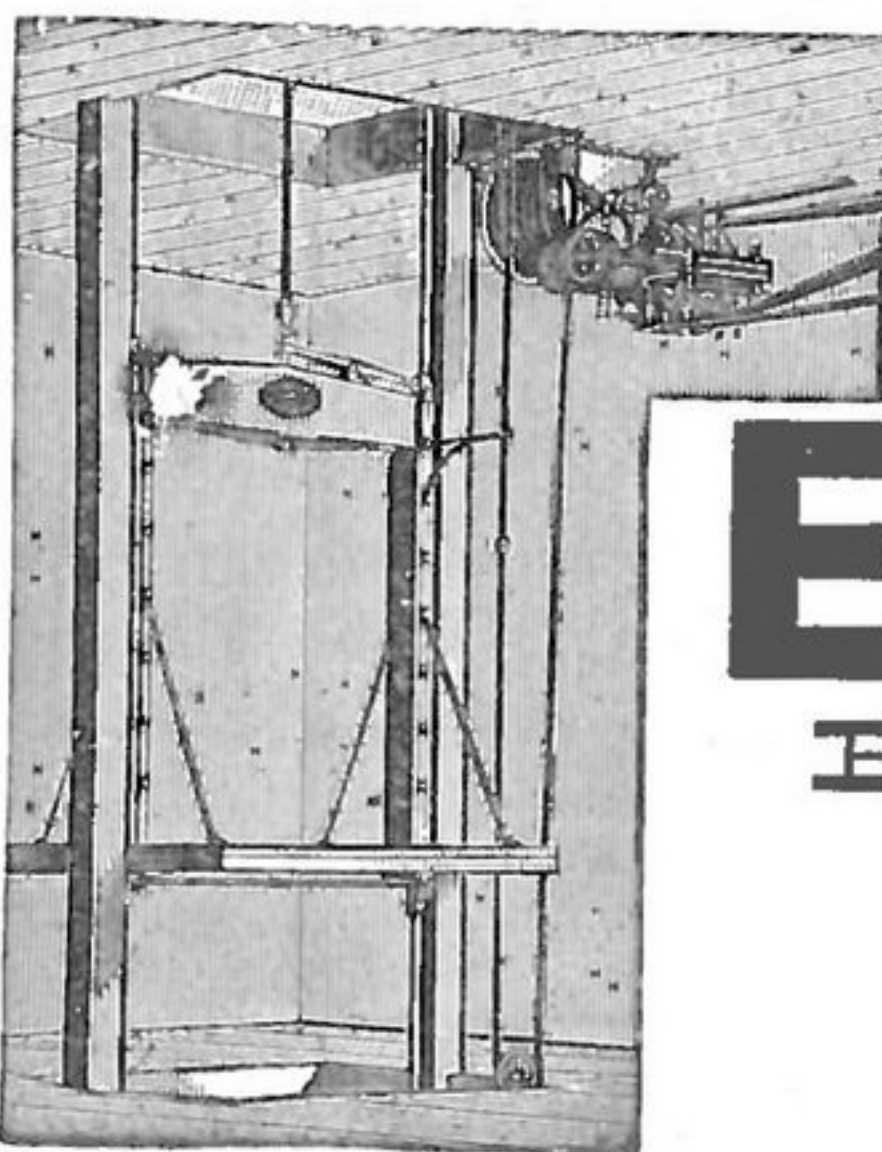
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TURNT SHAFTING

Lengths from 2 to 20 feet long. Special prices on large quantities.

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"The Millstone" one year, \$1.

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IMPROVED.

Stands at the Head of all Boiler Feeders.

Simple, Effective and Durable.

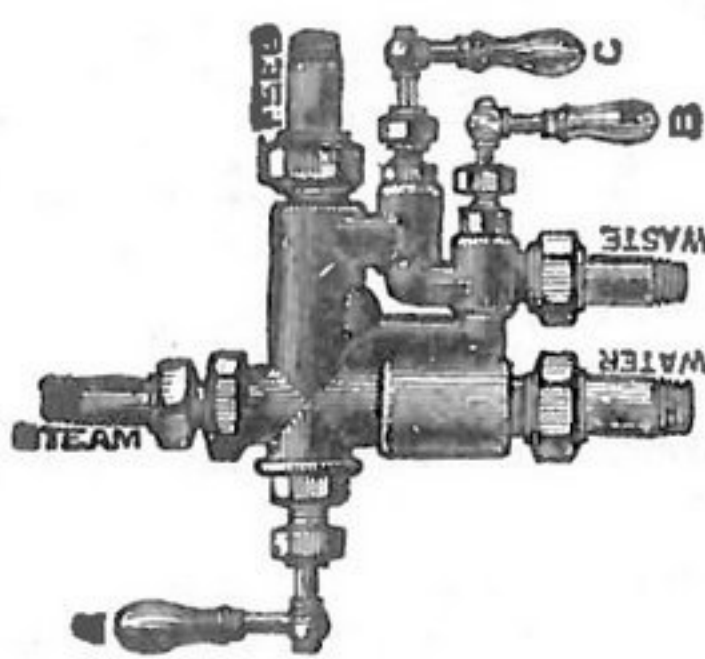
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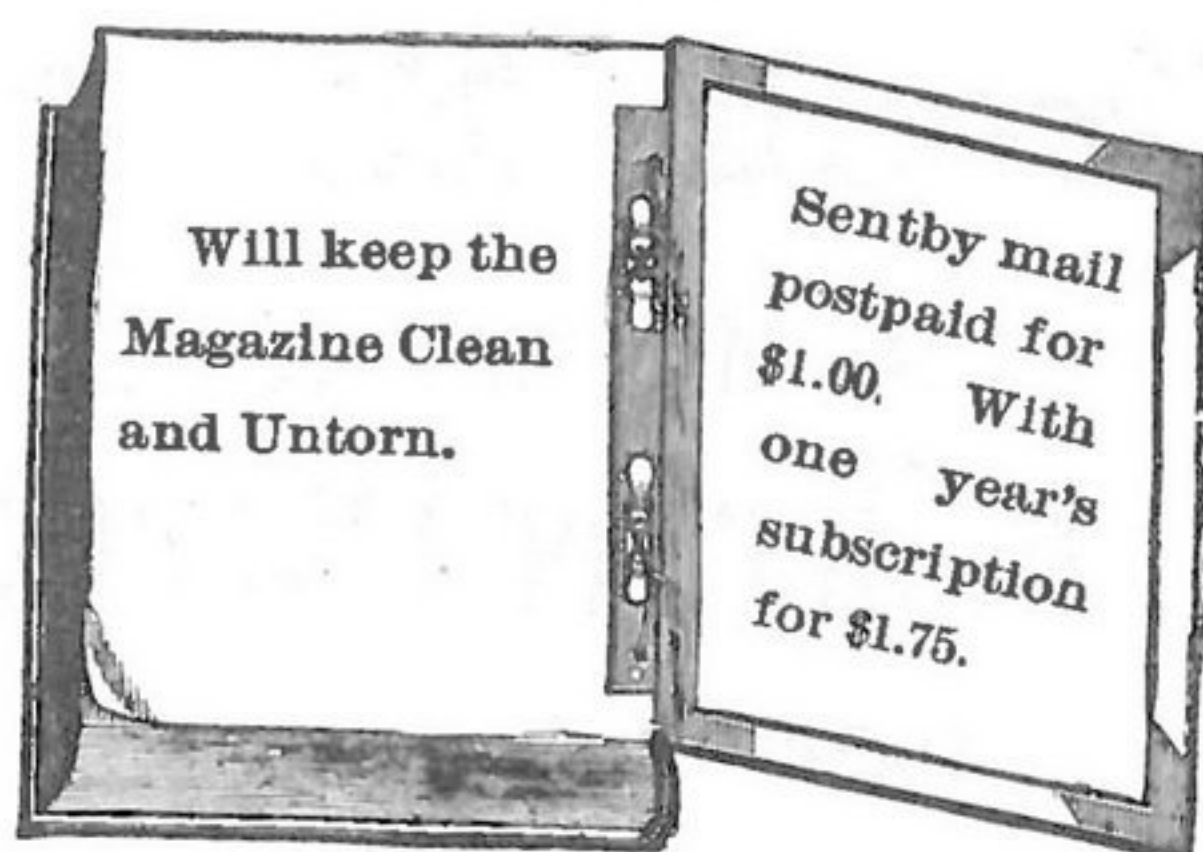
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"Peerless" Binder.



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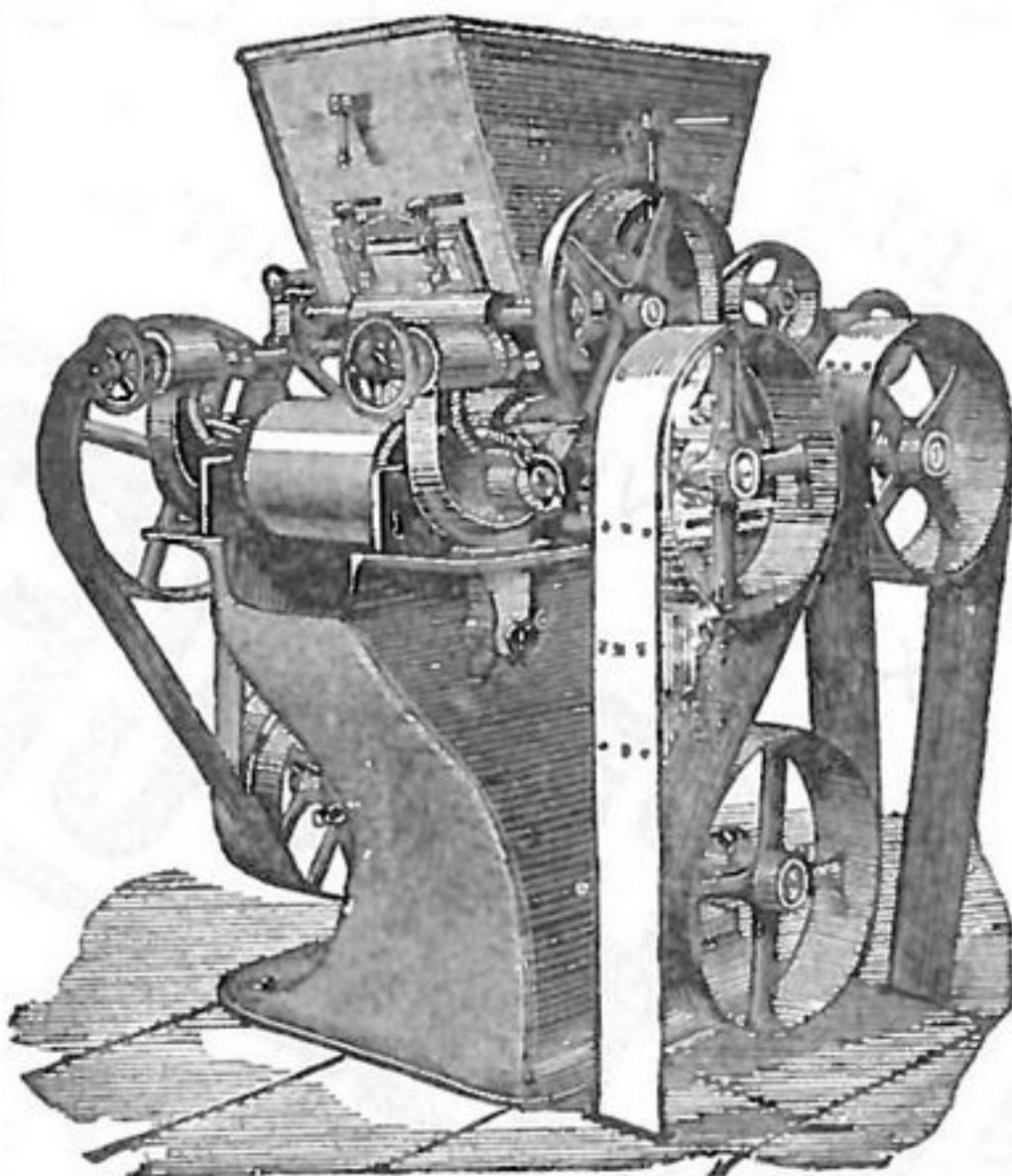
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BOLTING CLOTH,

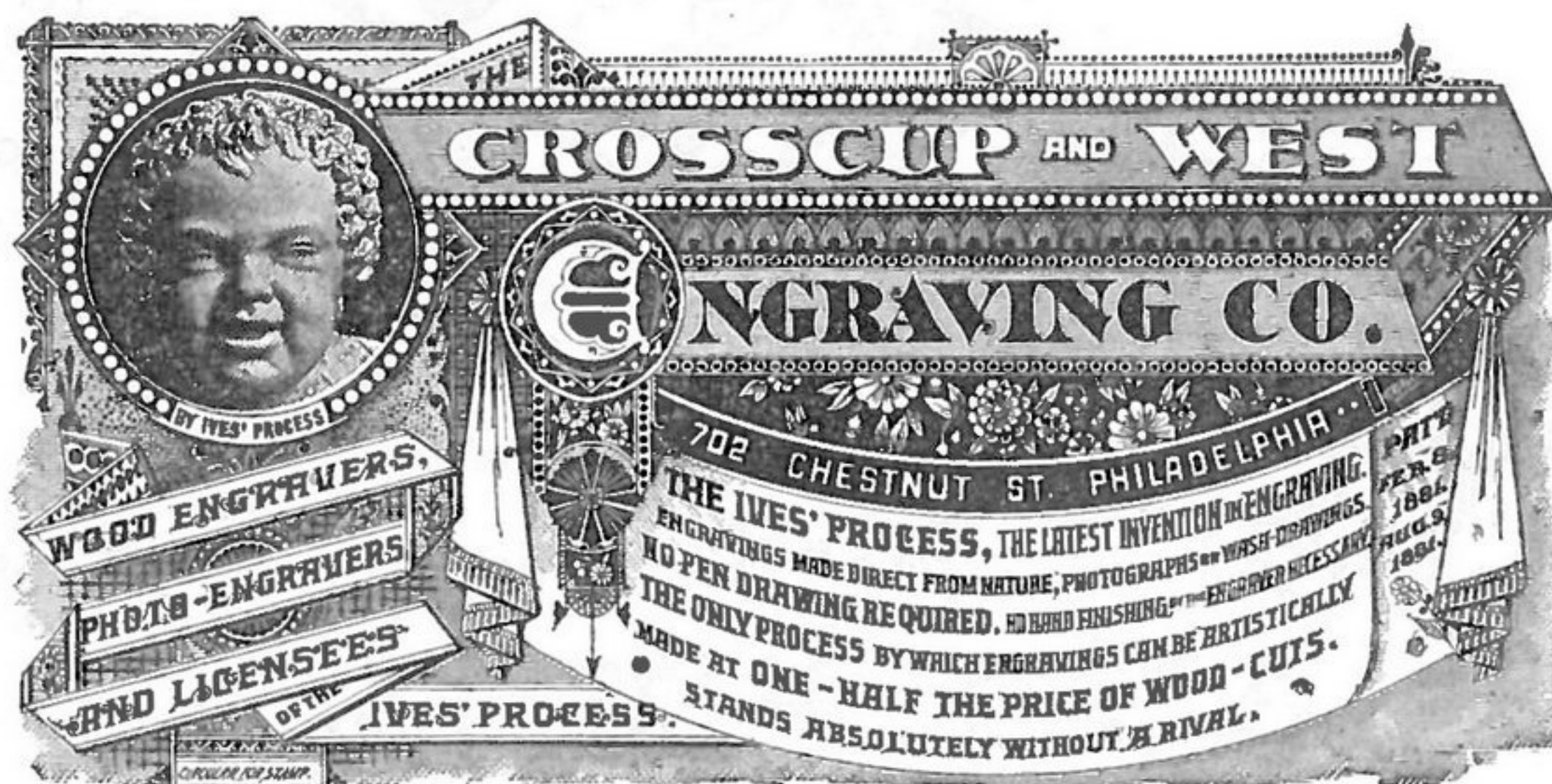
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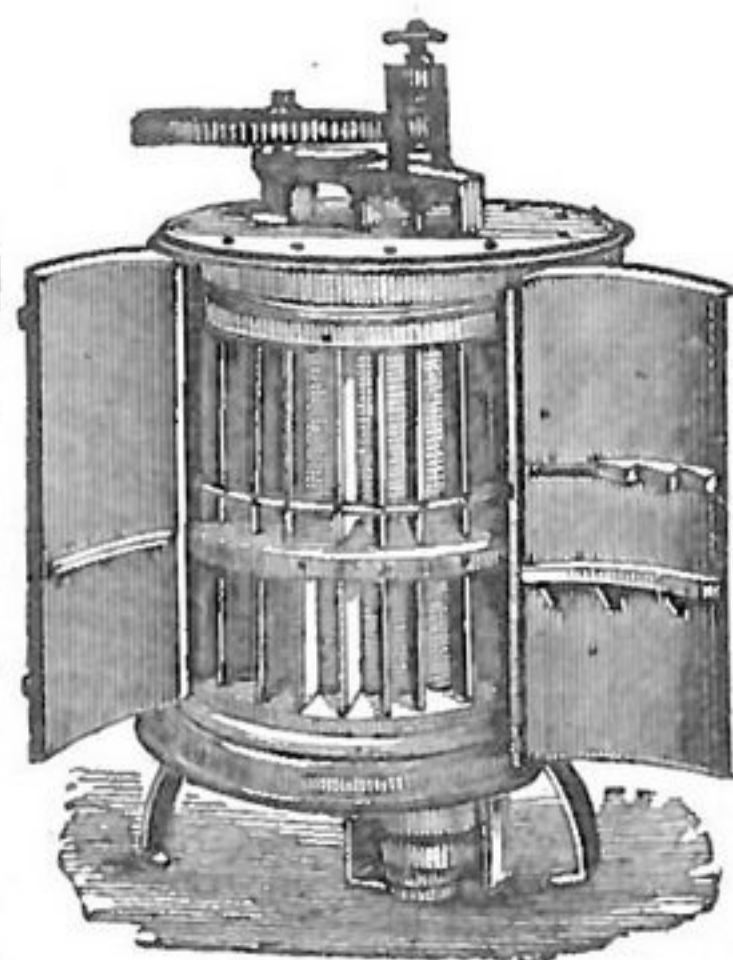
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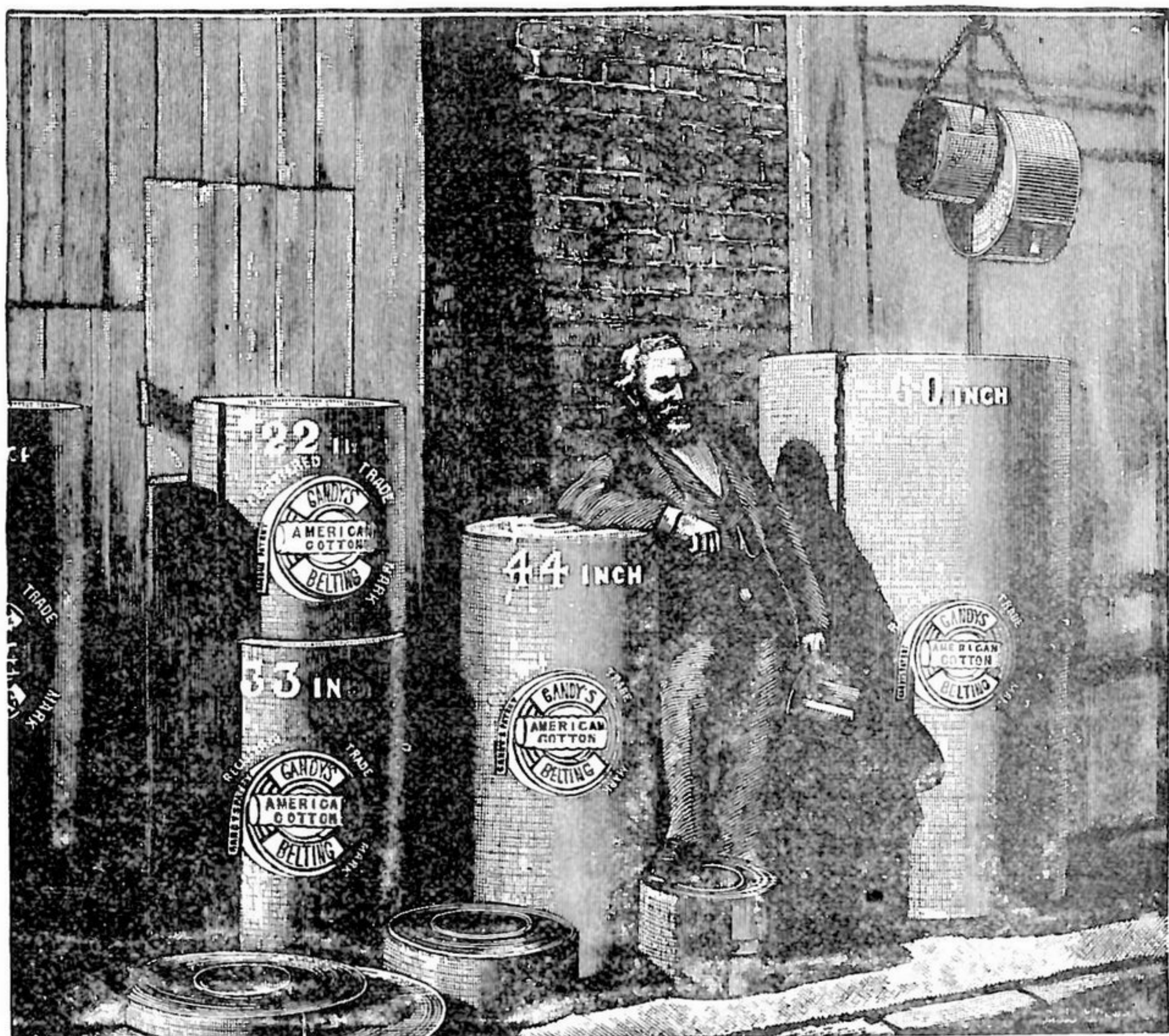
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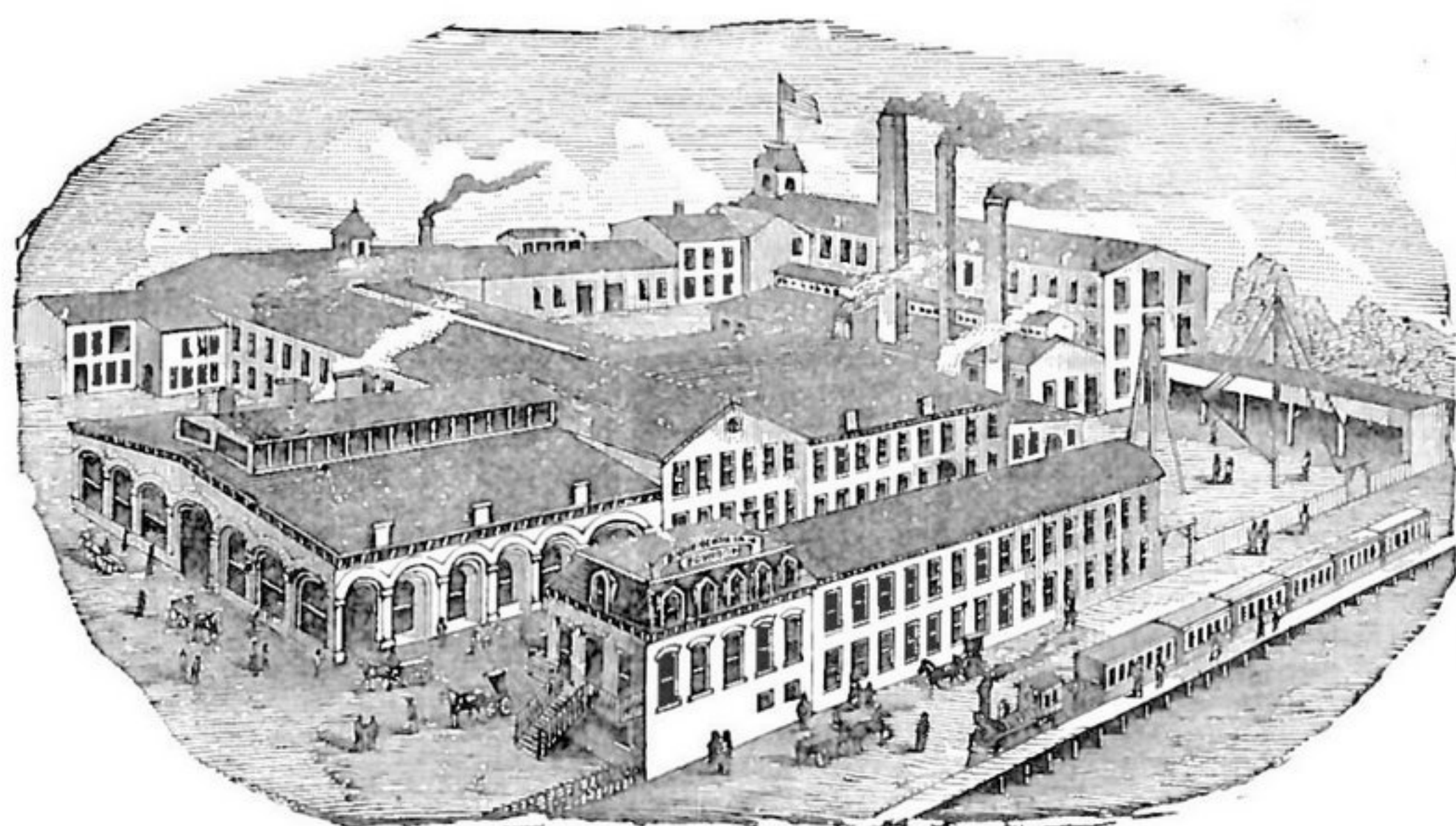
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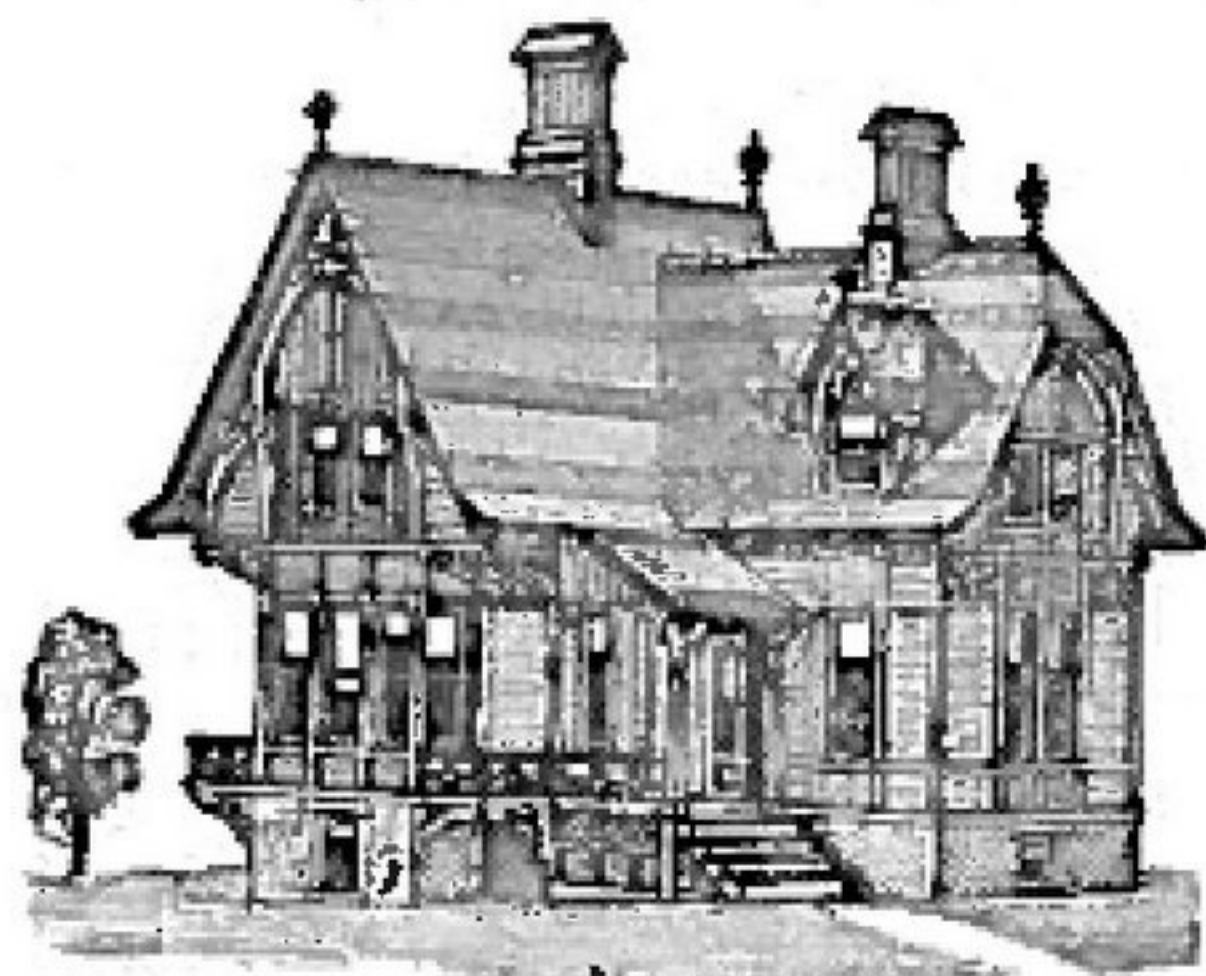
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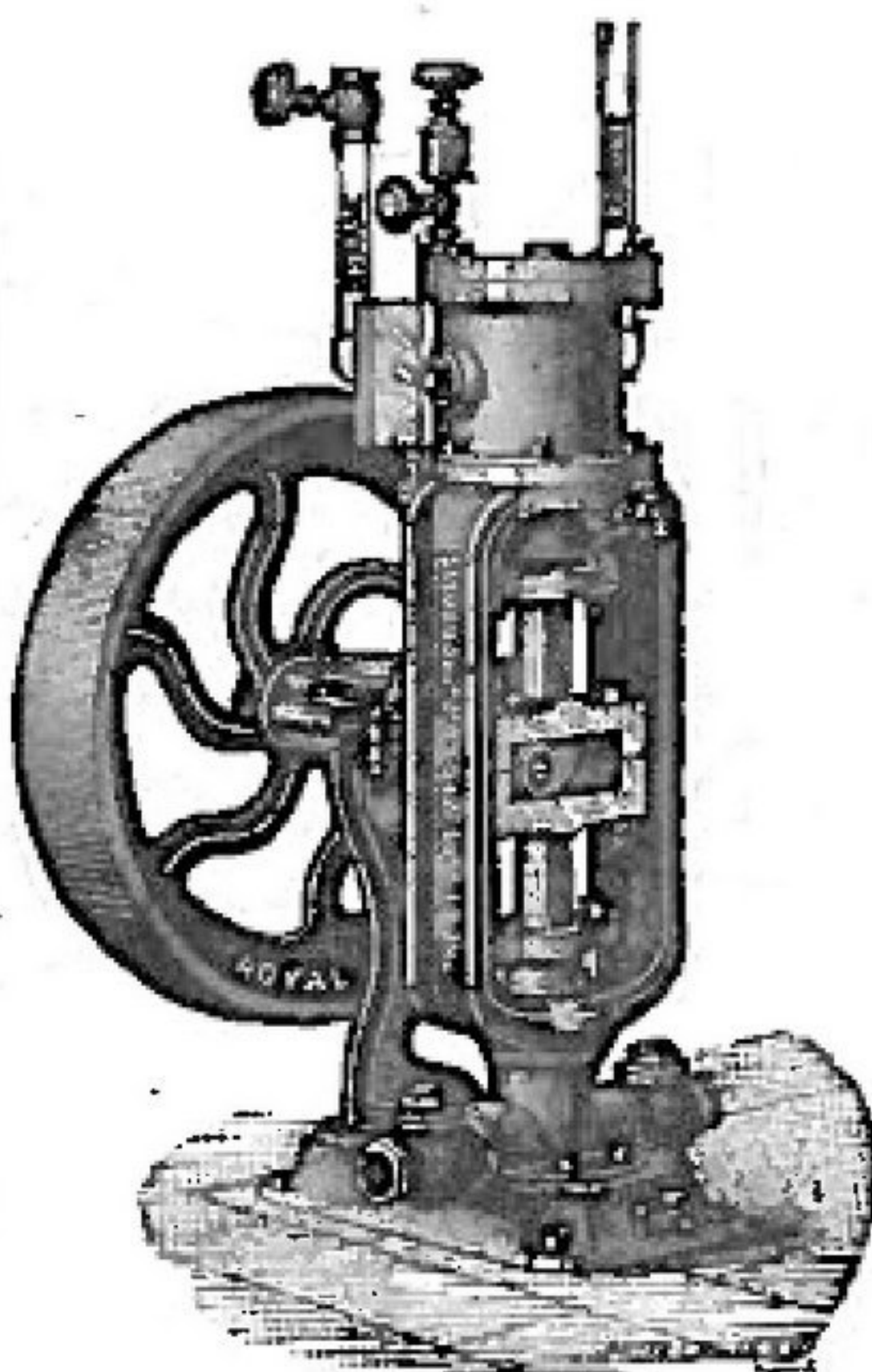
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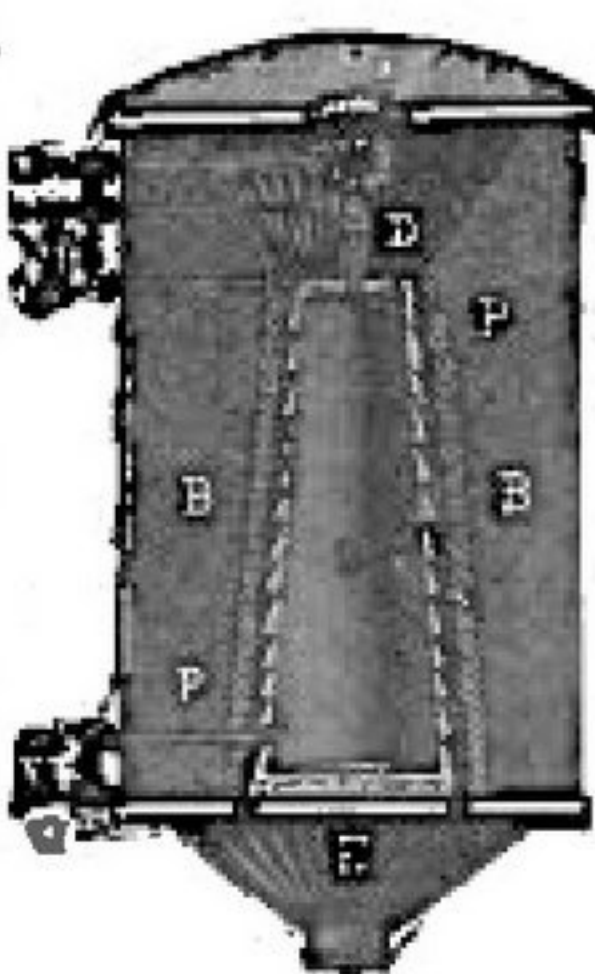
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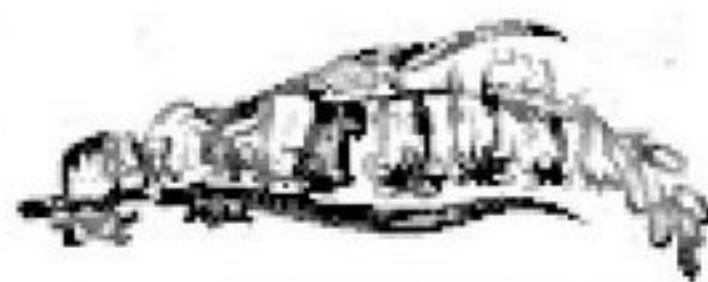
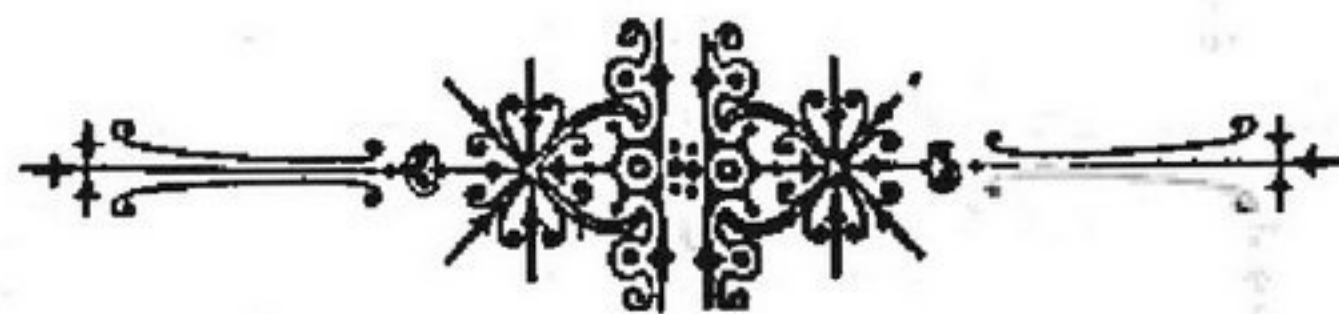
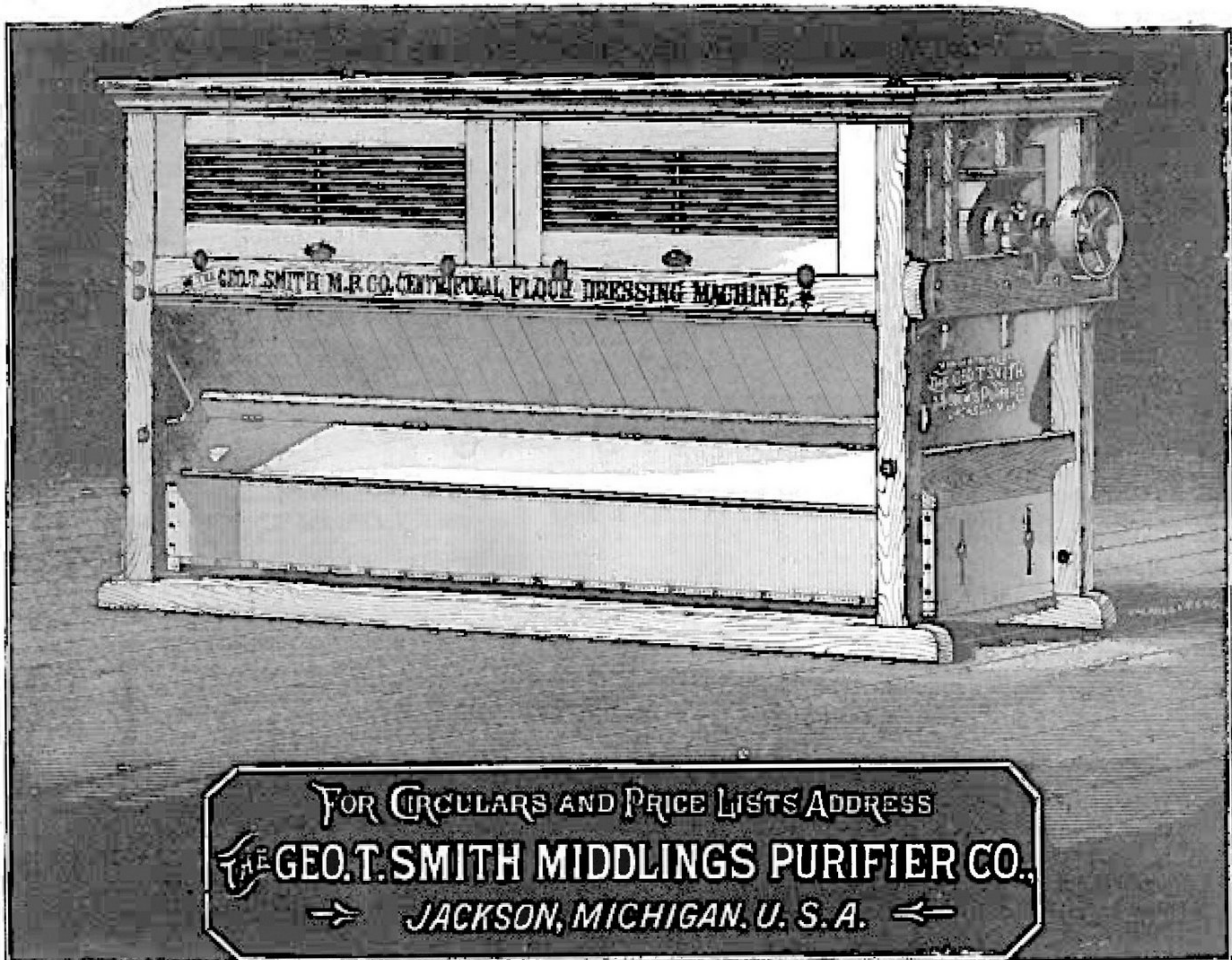
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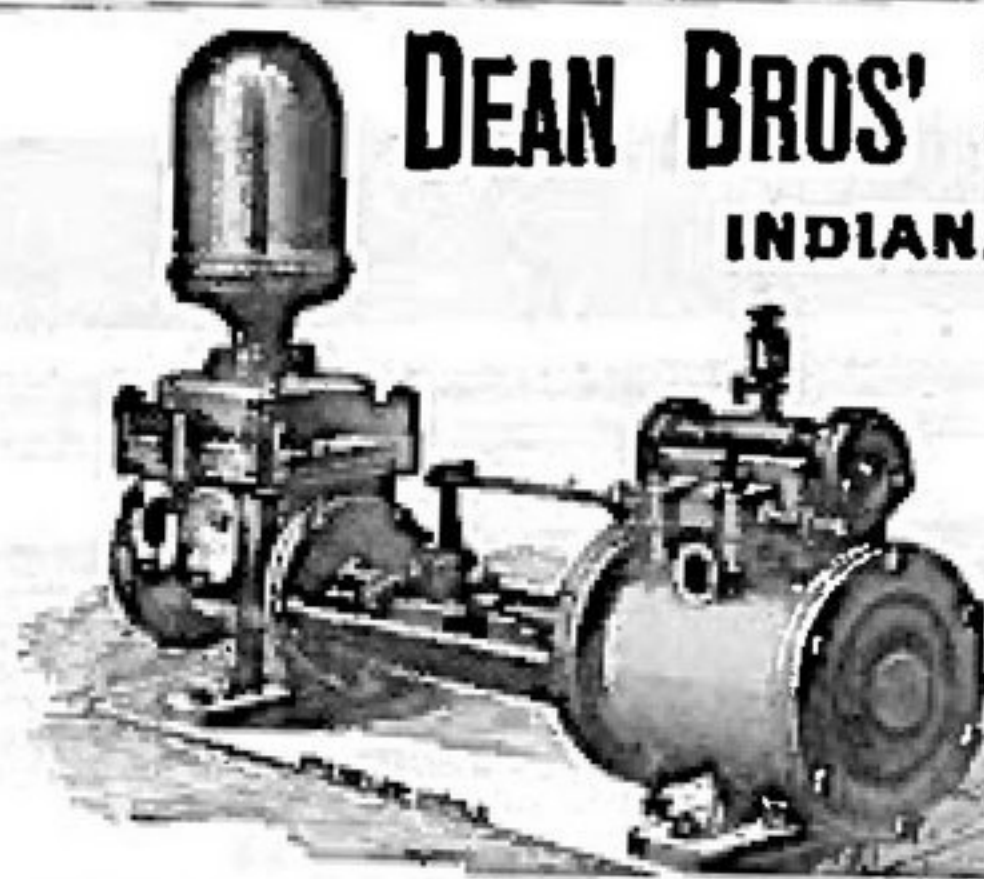
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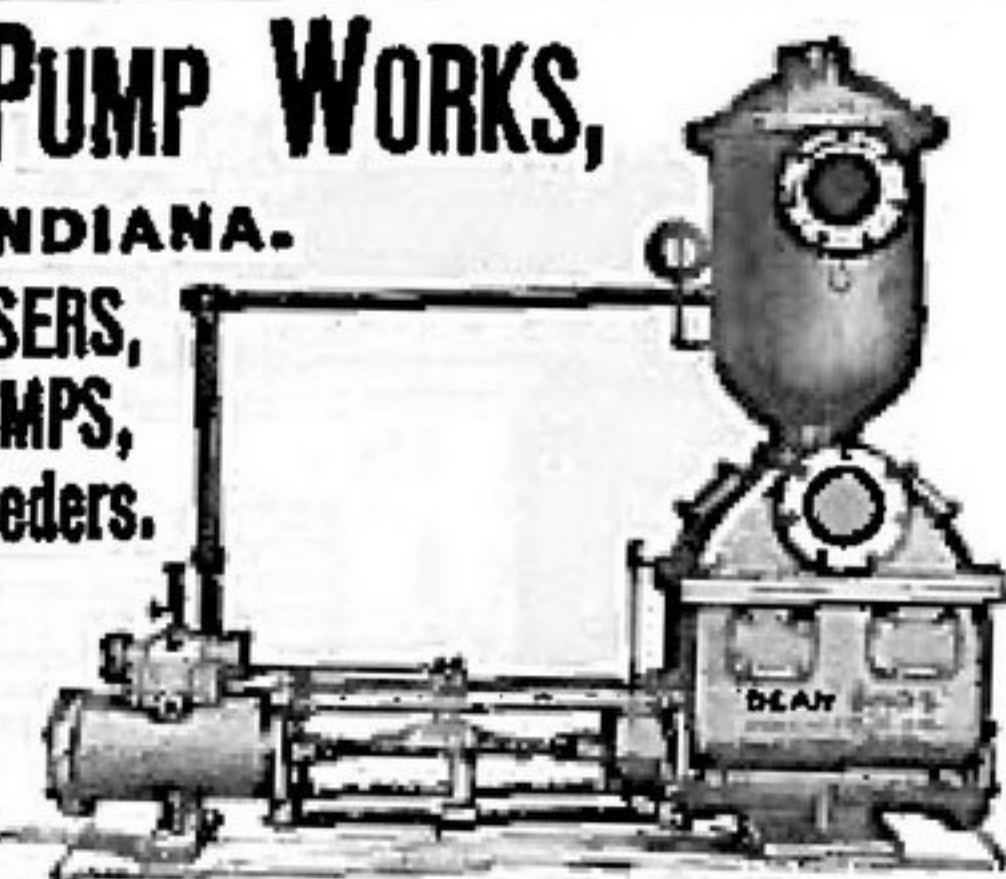
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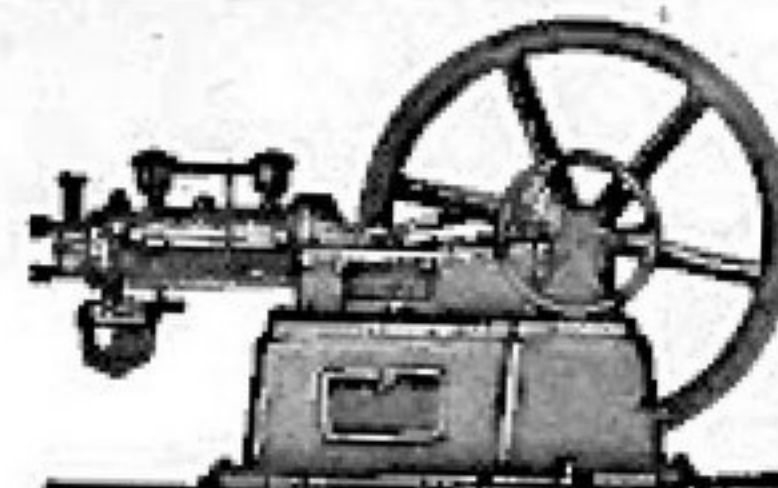


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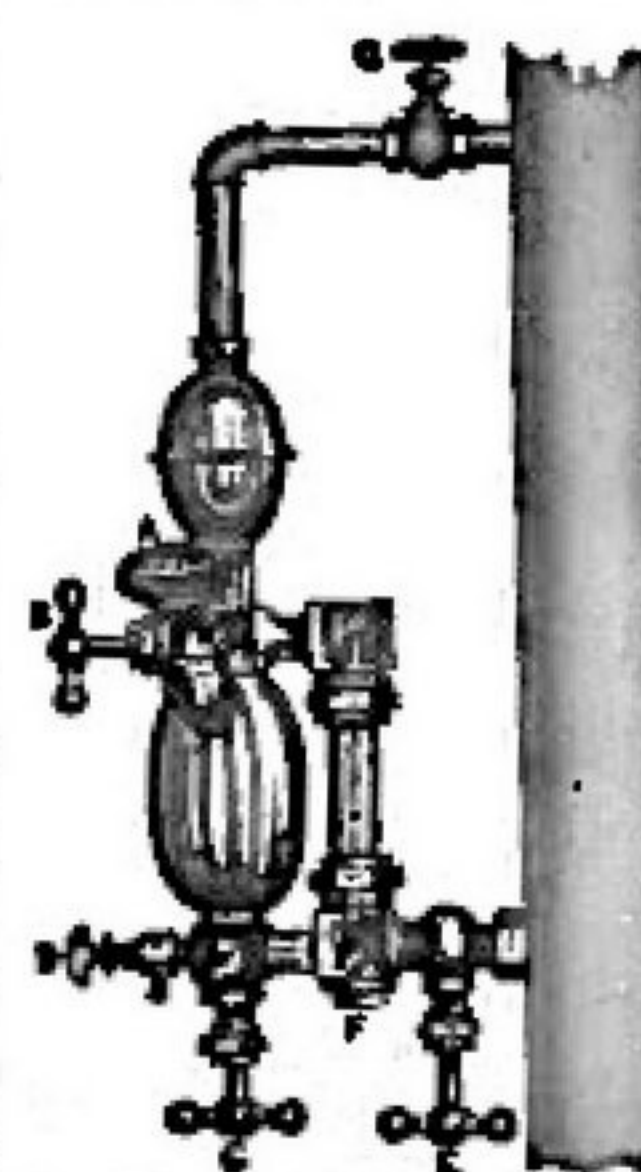
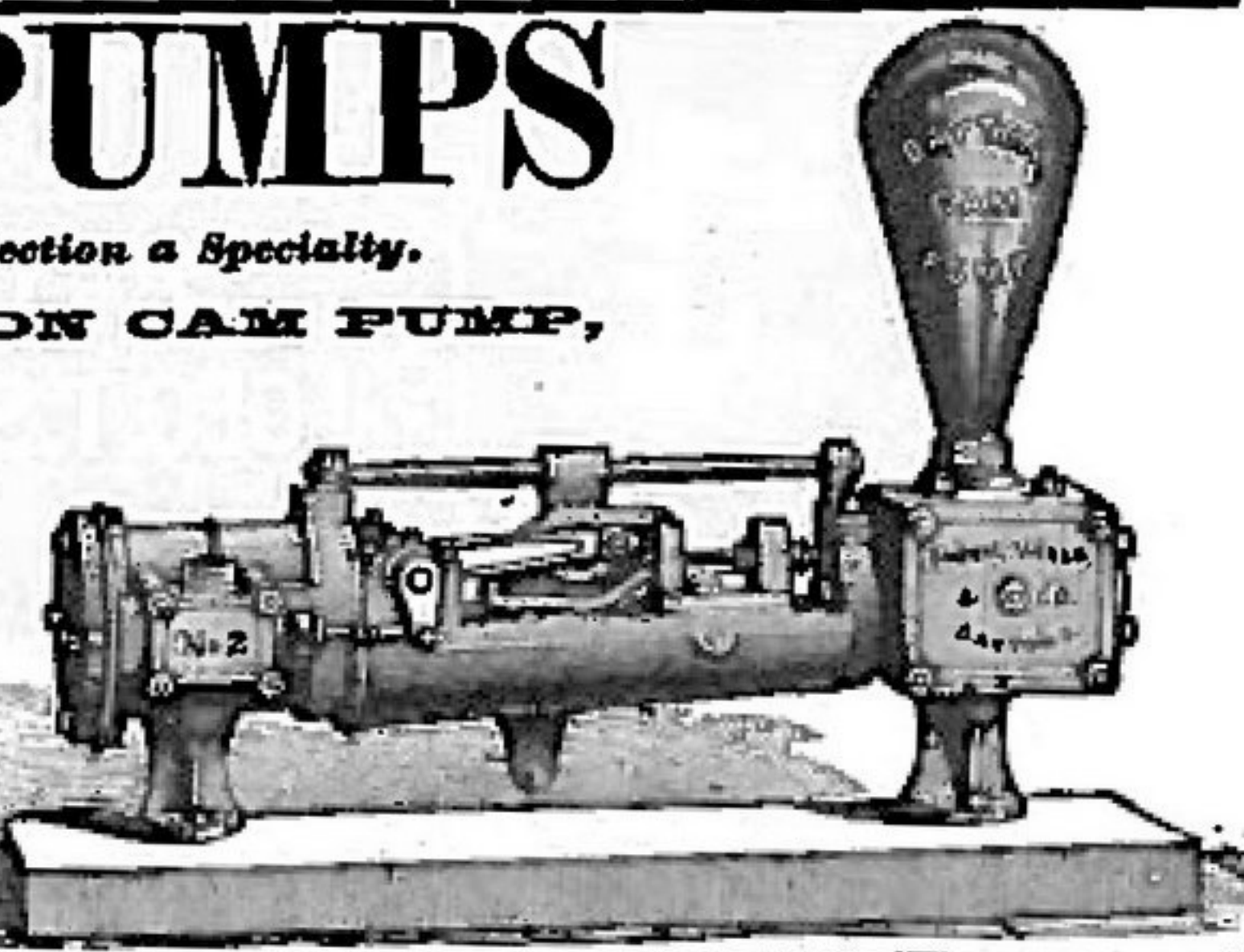
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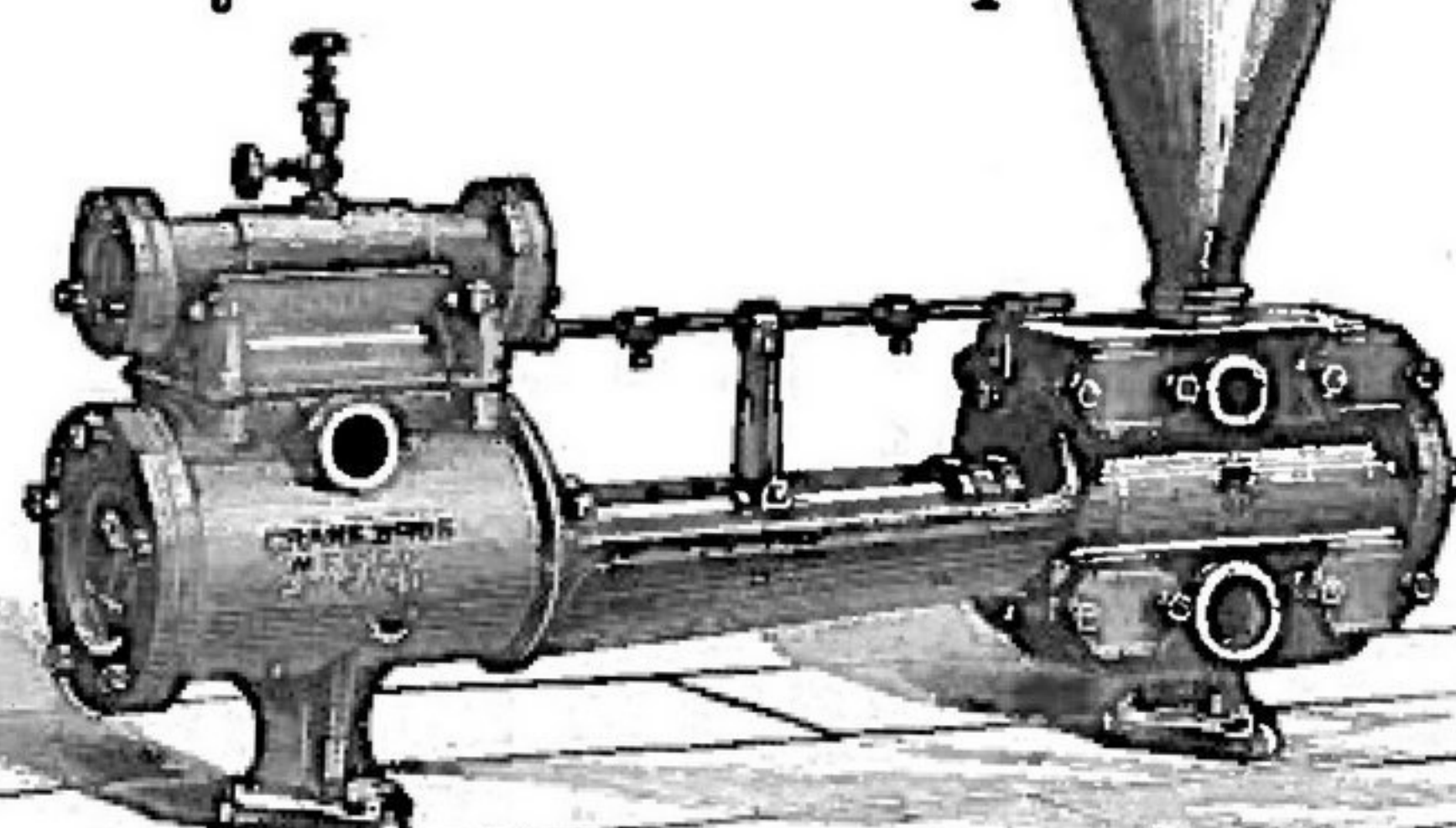
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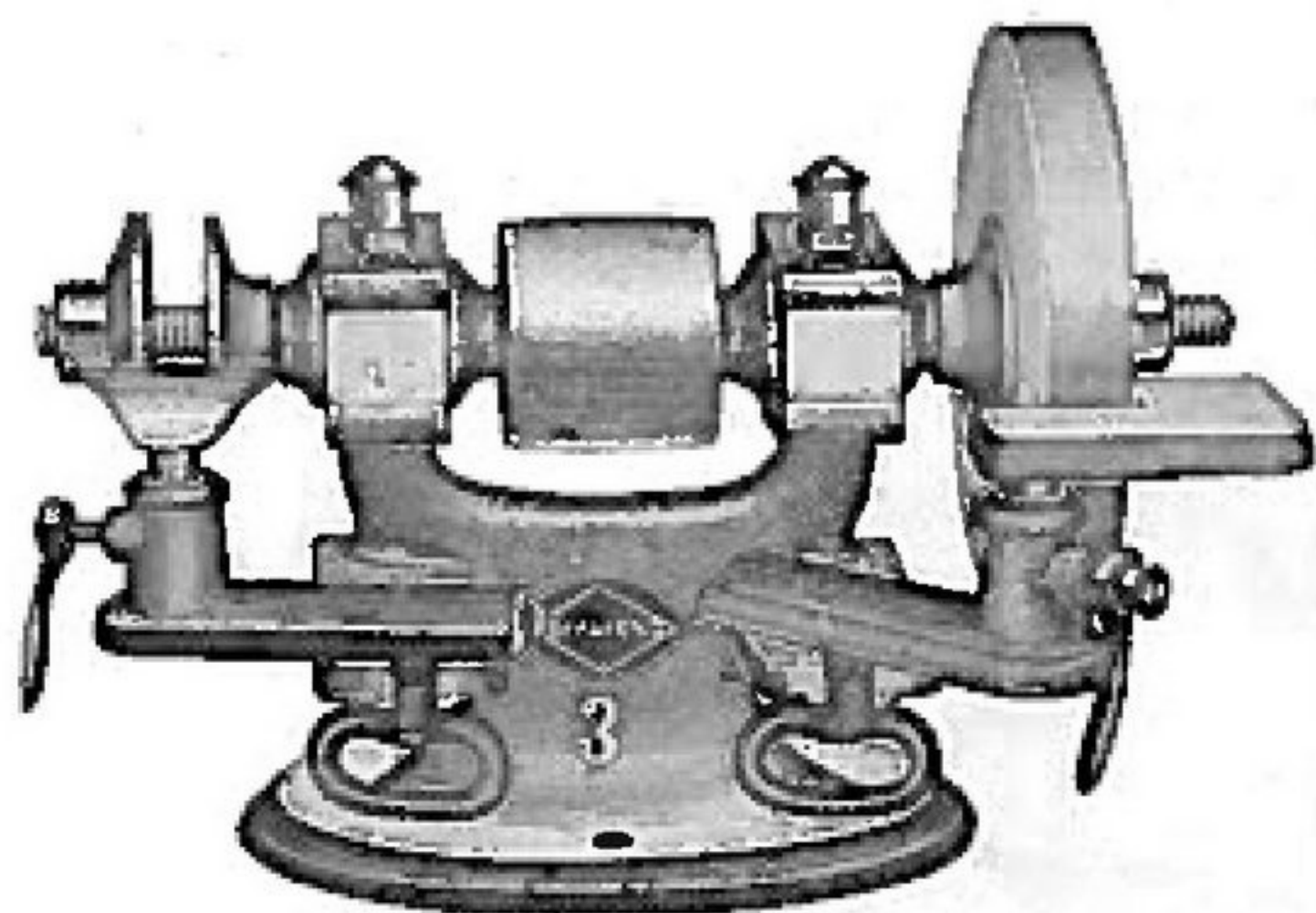
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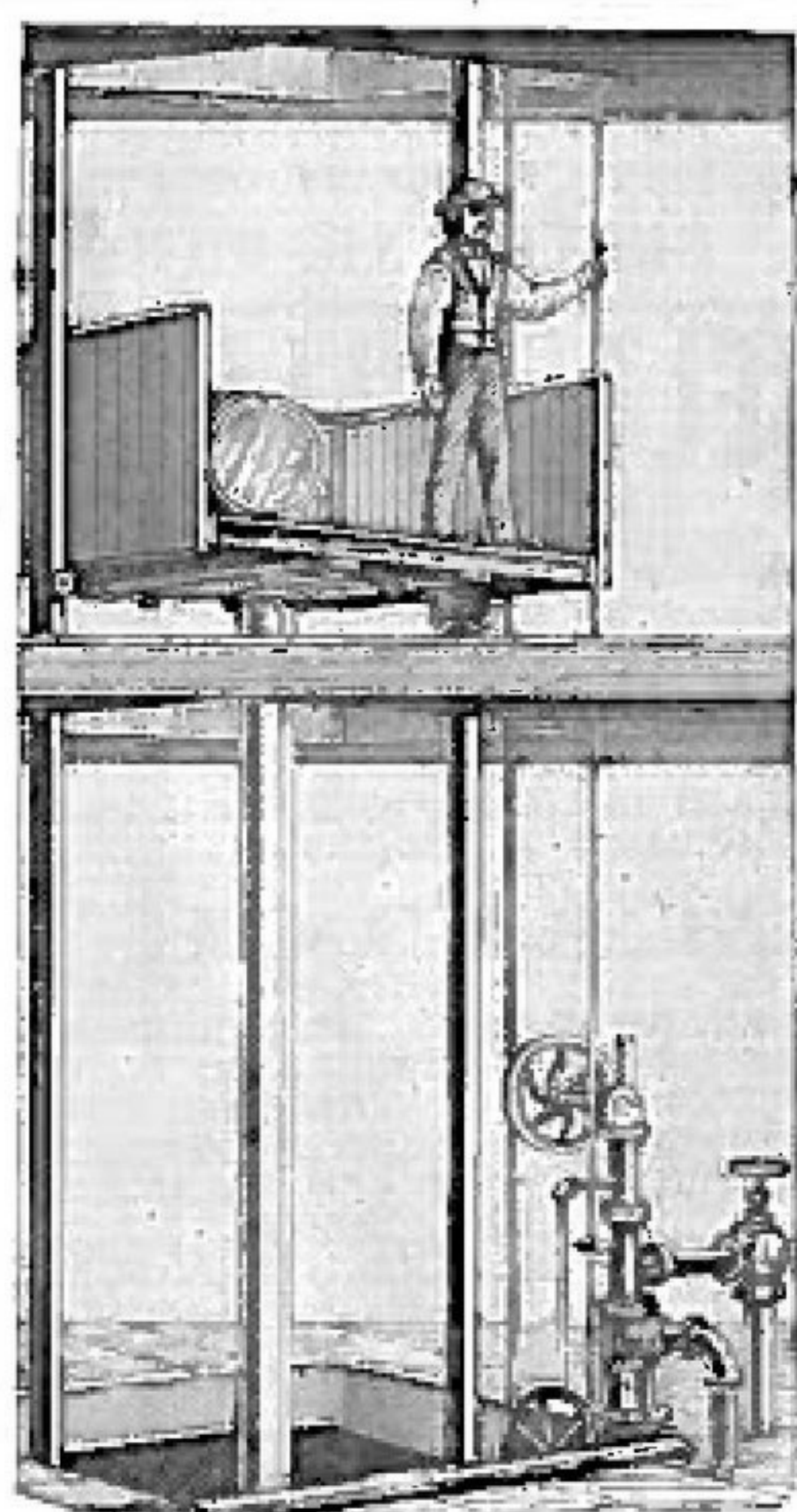
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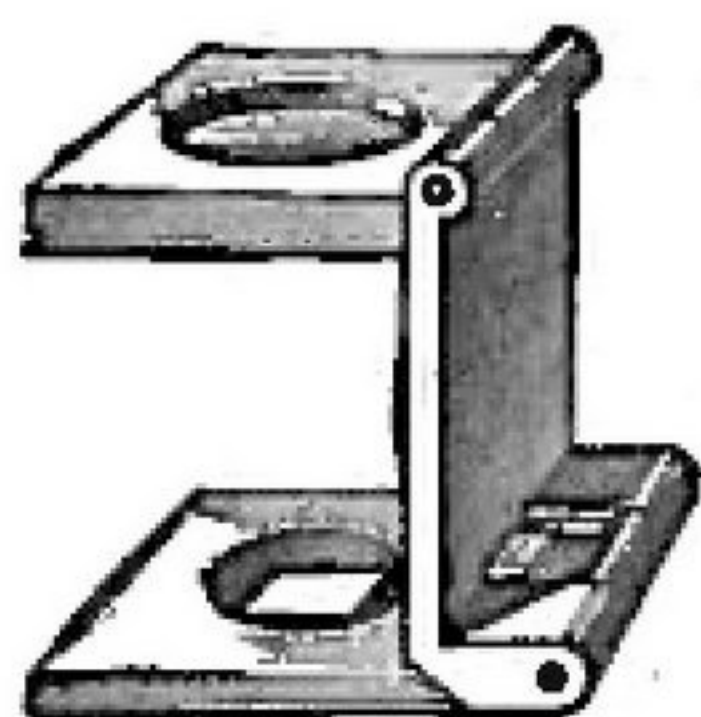


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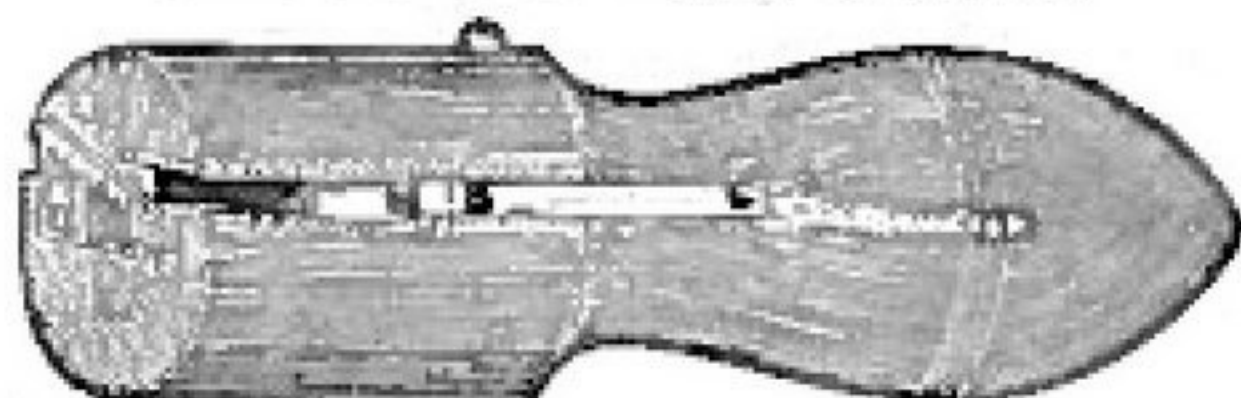
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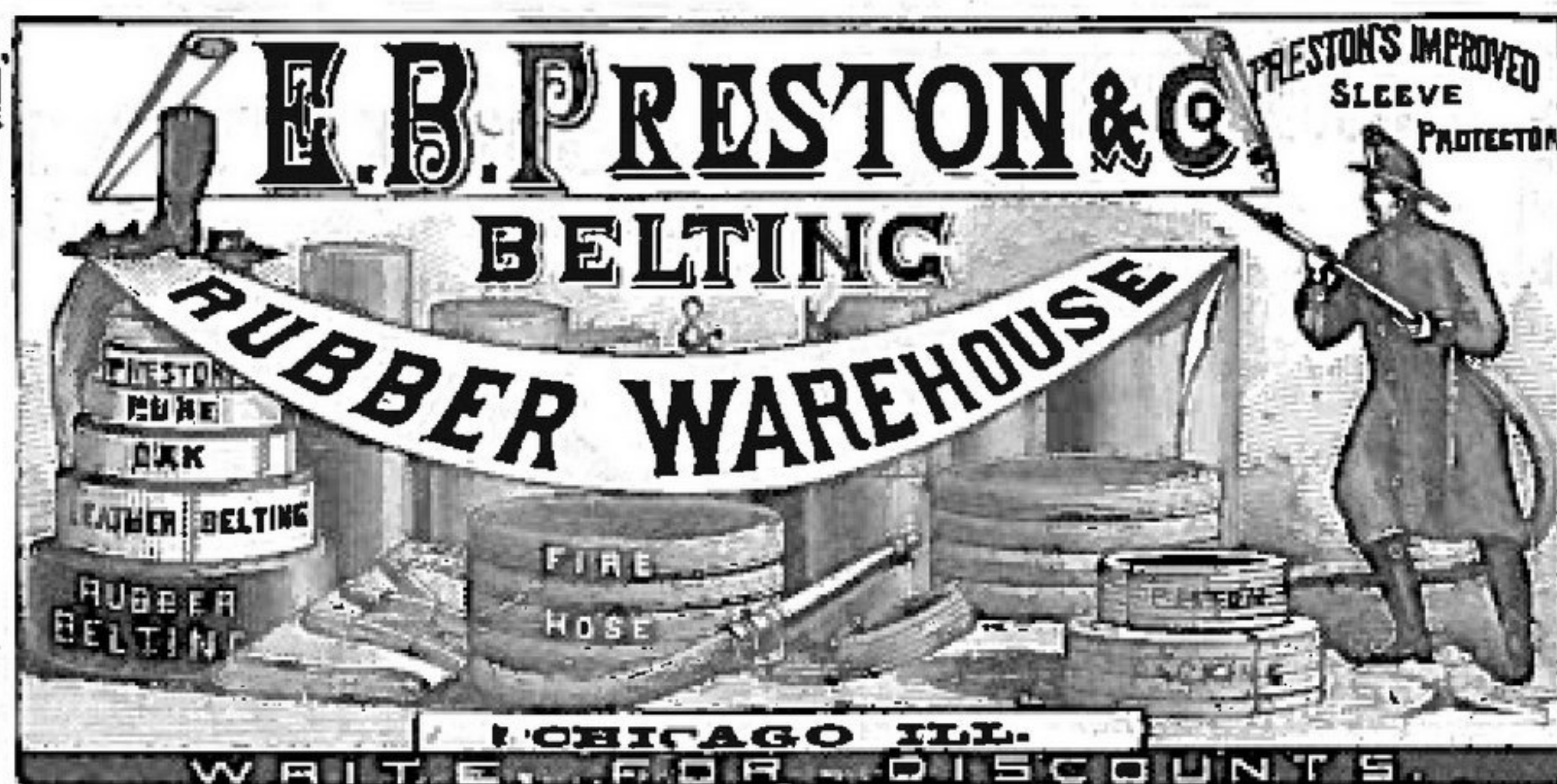
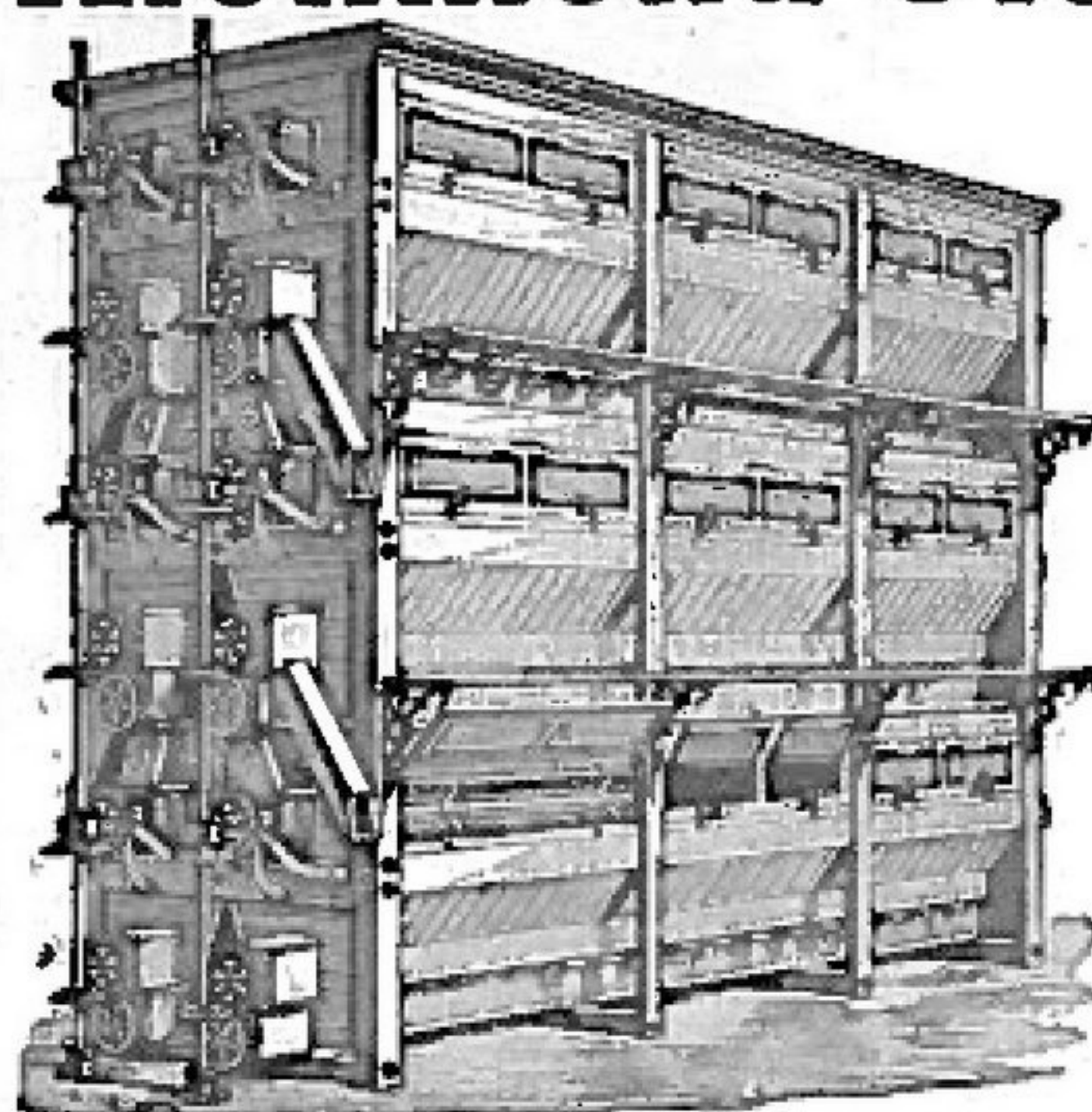
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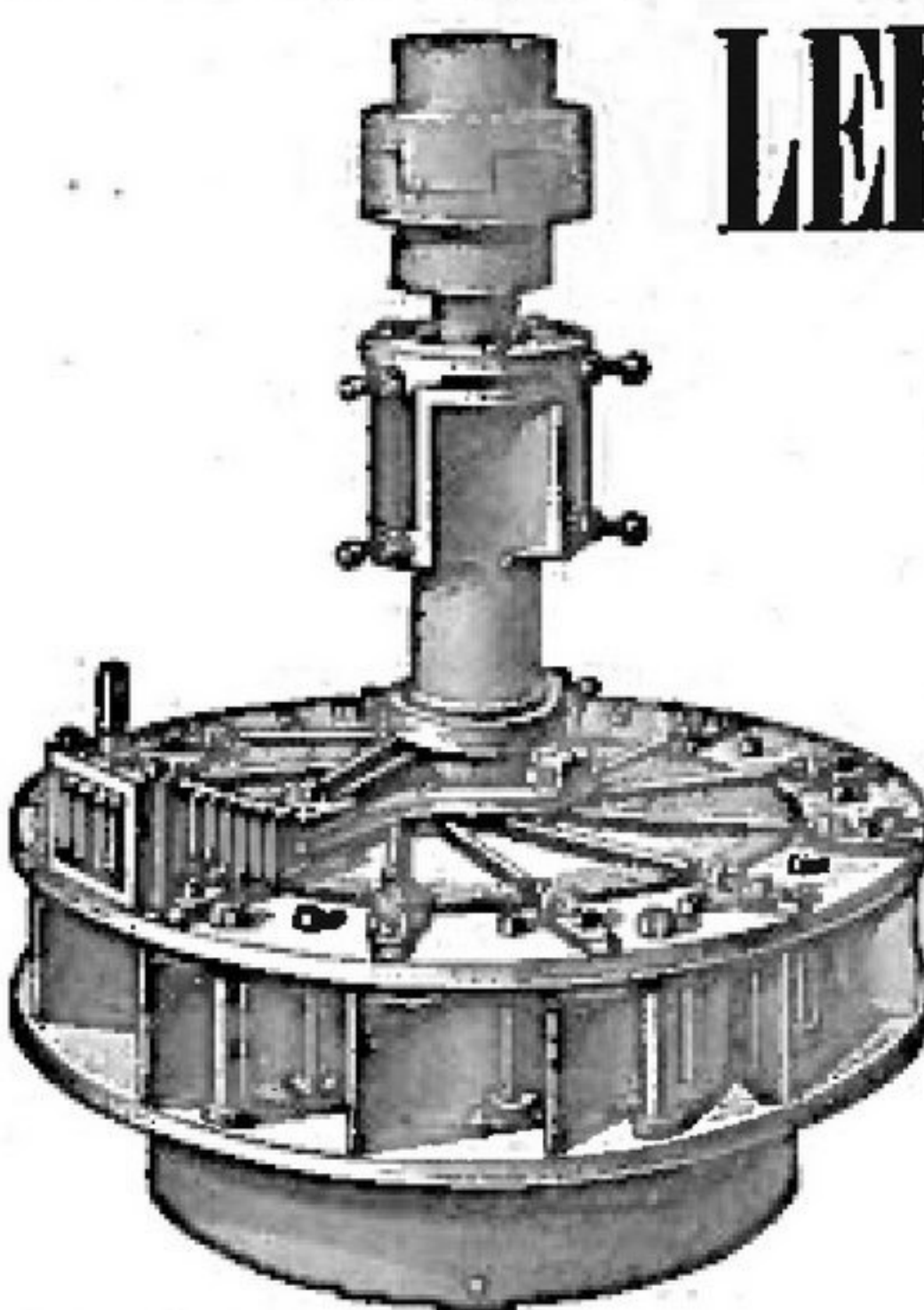
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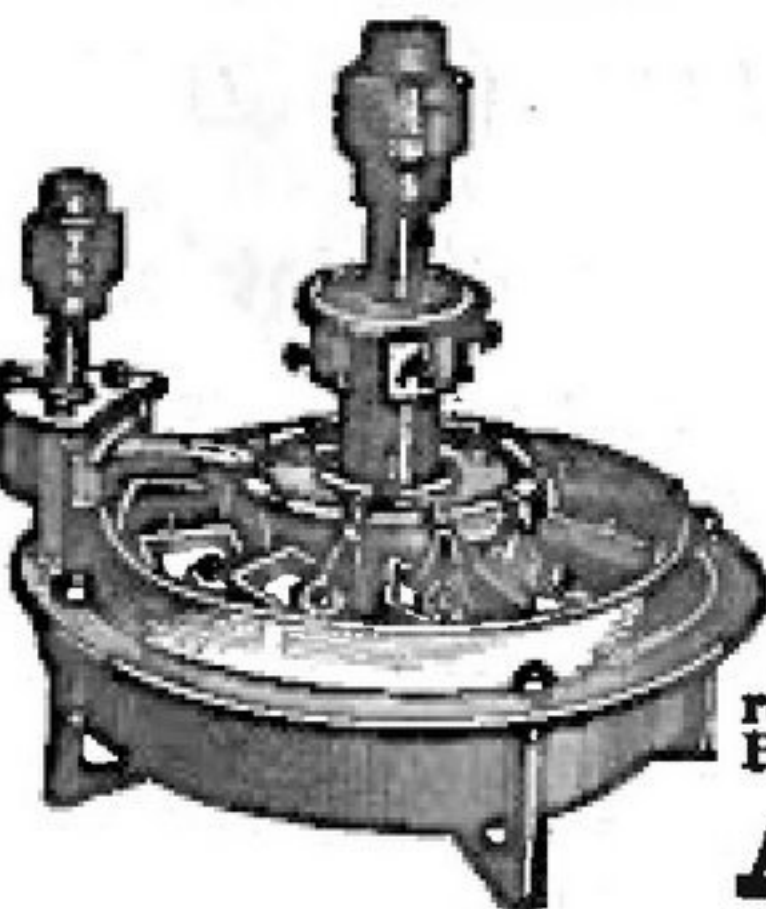
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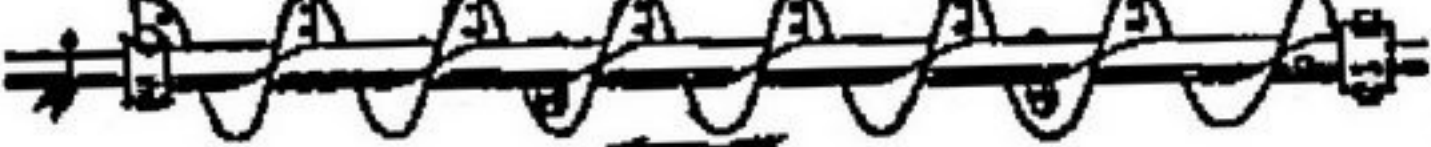
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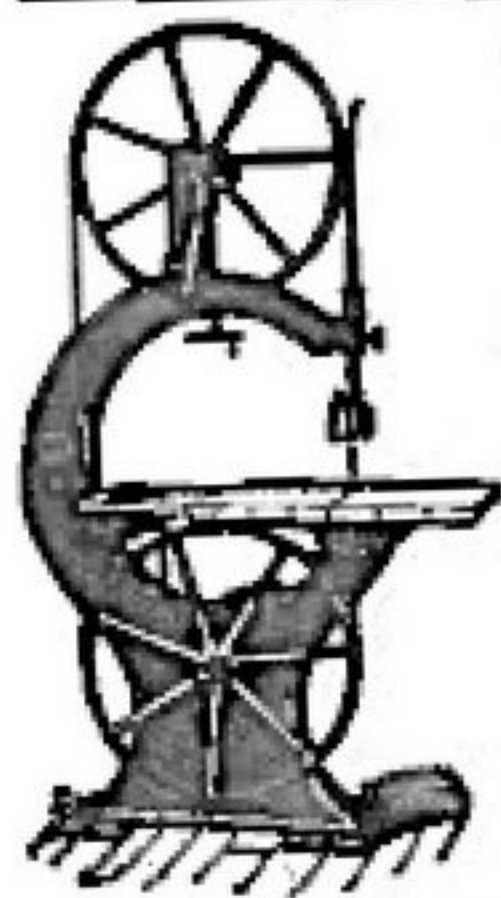
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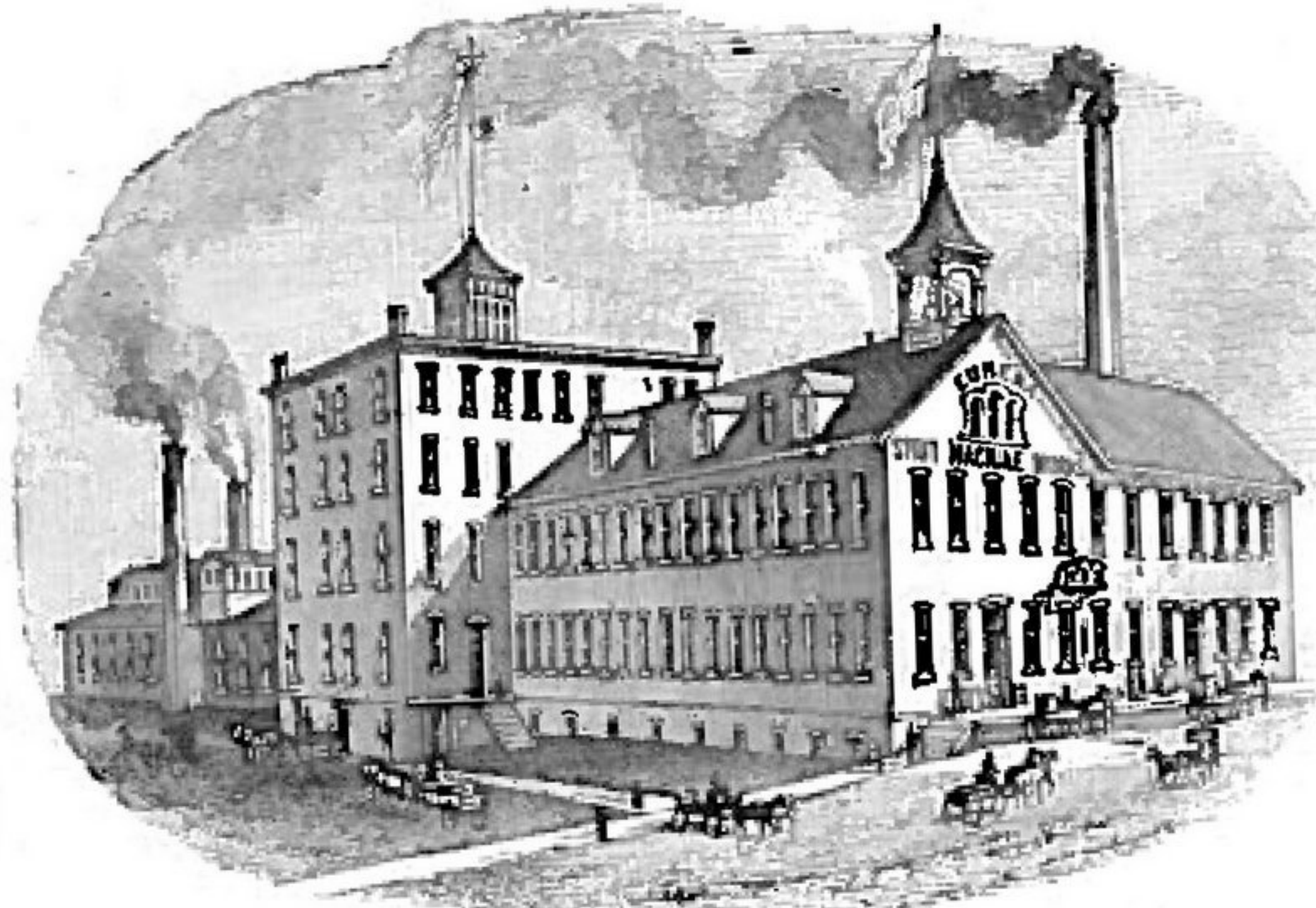
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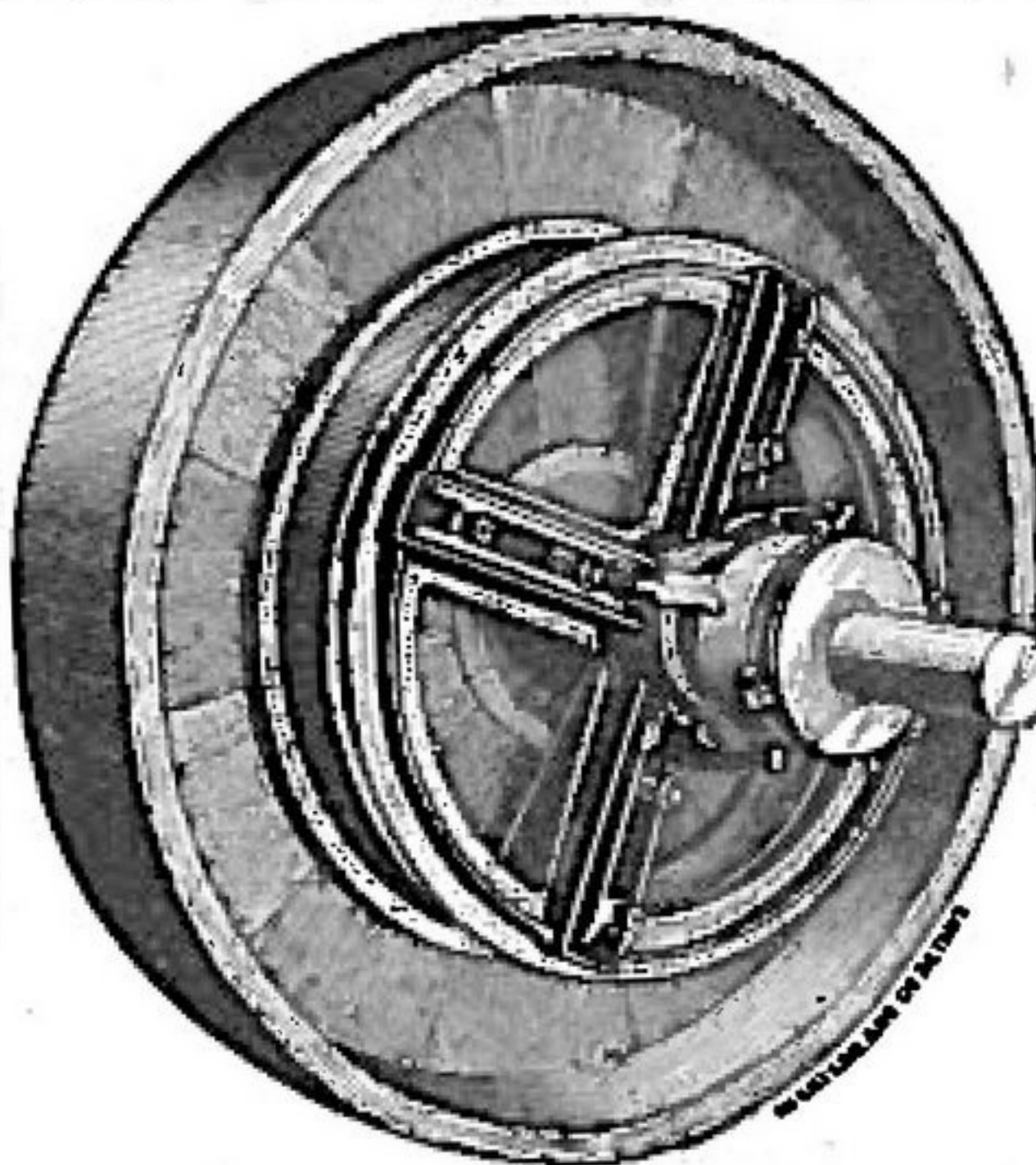
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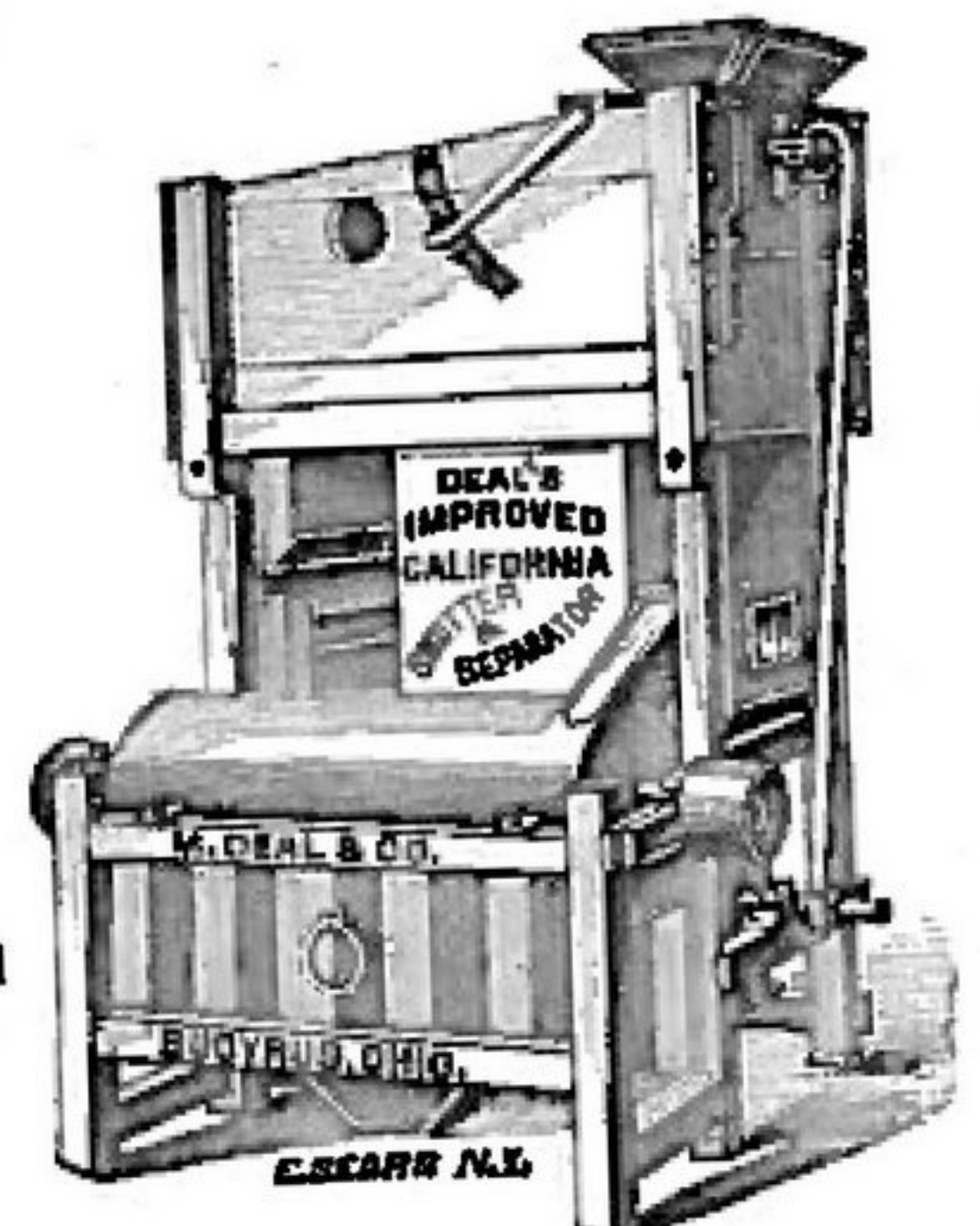
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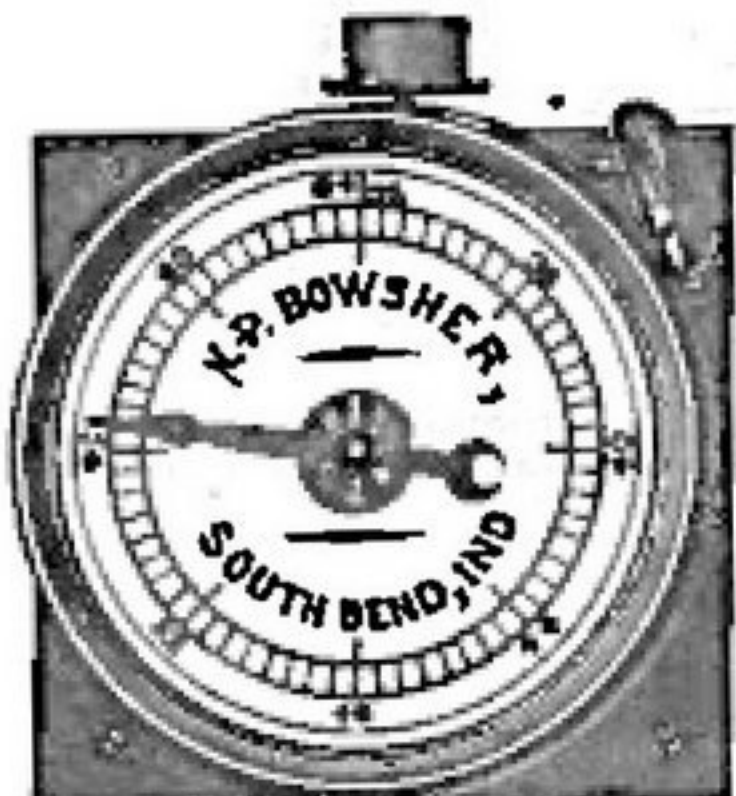
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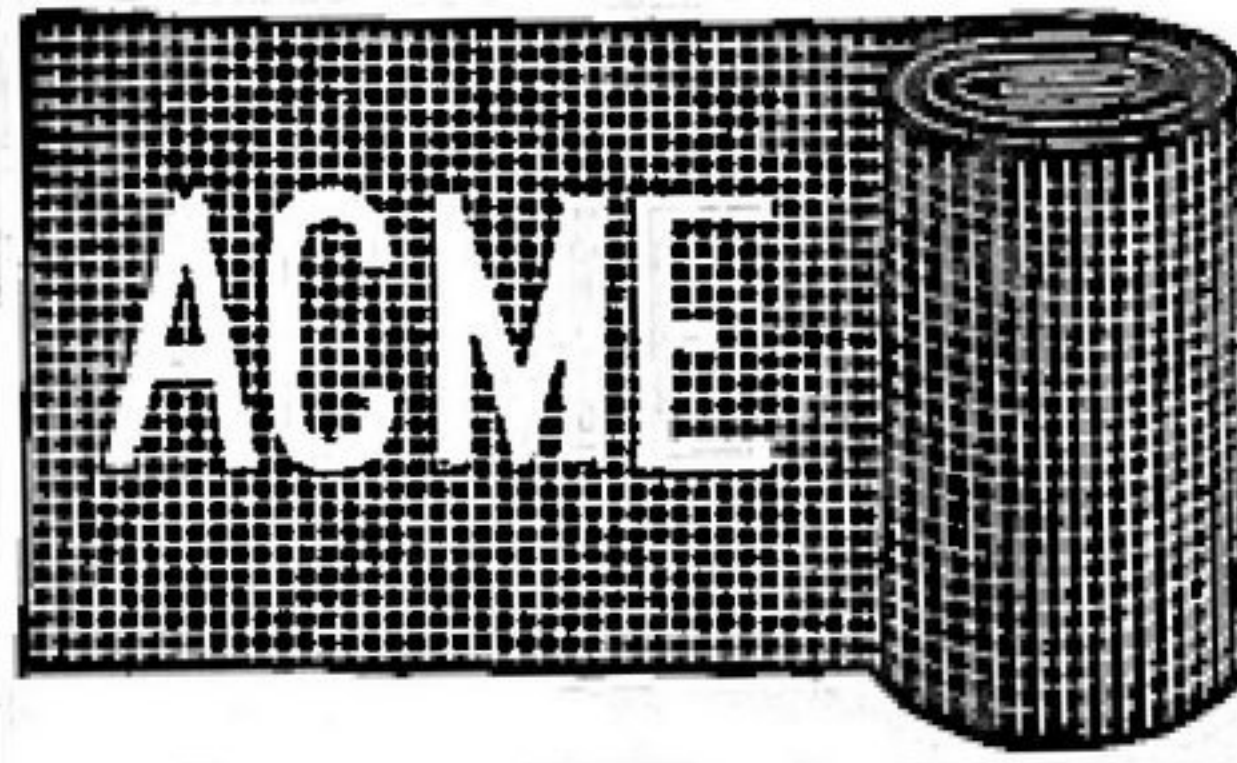
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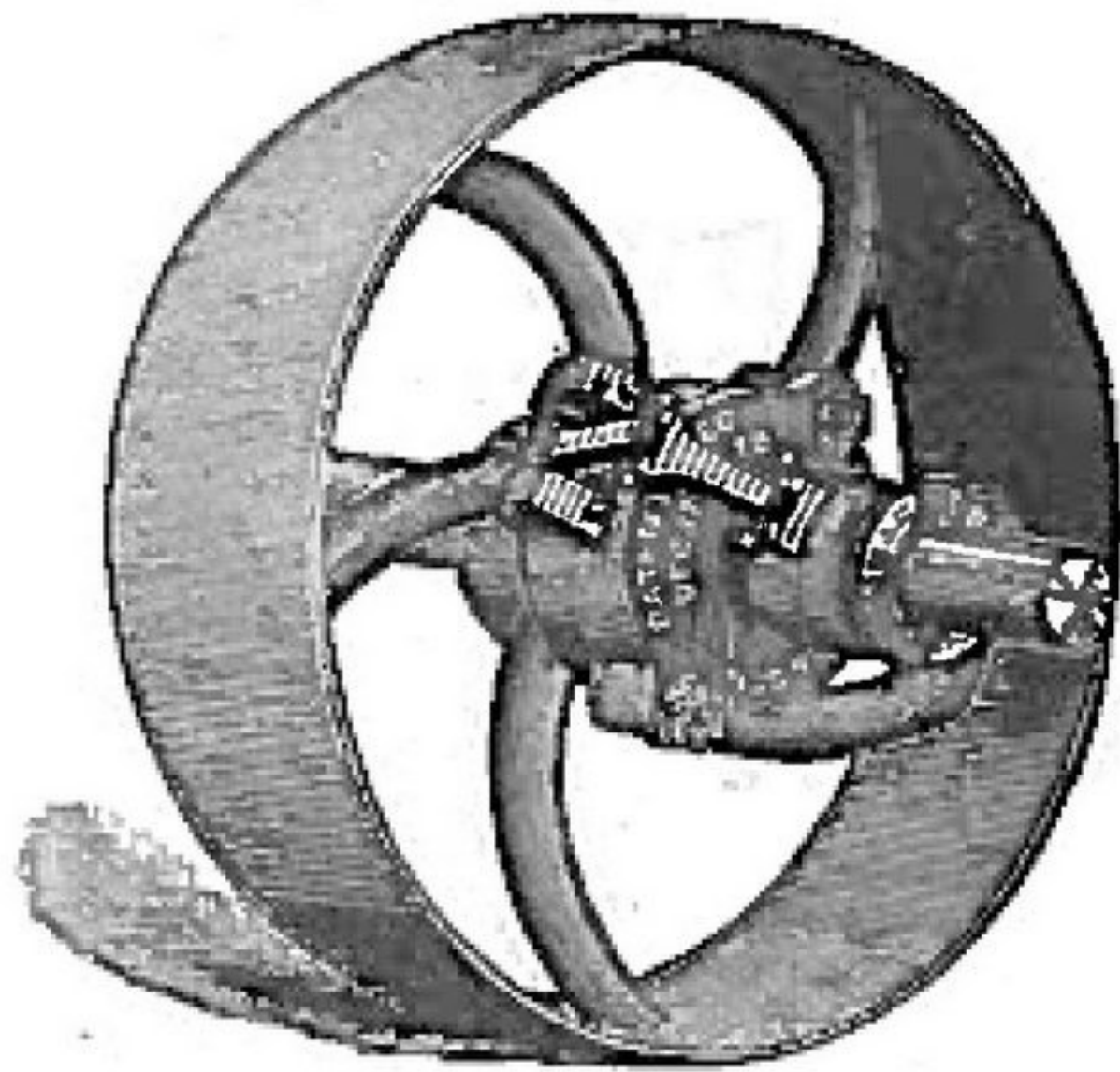
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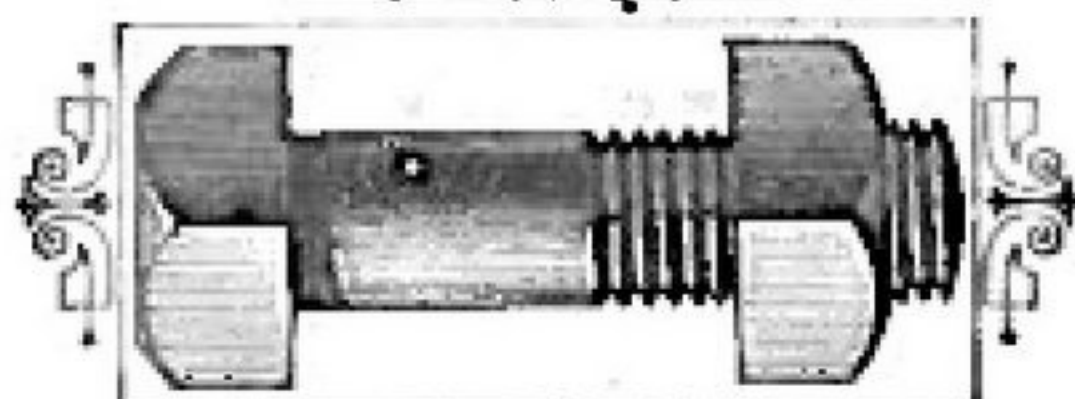
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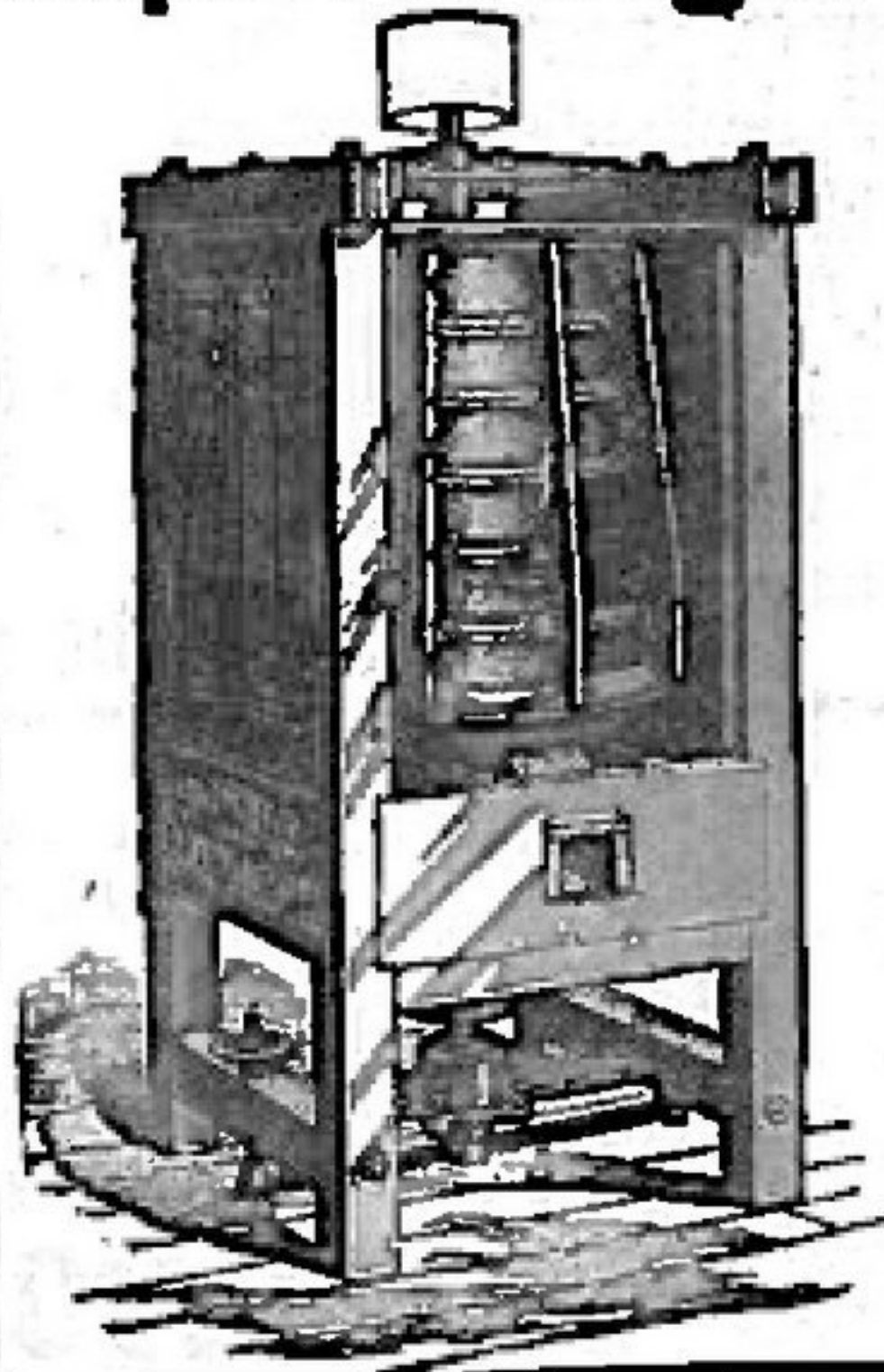
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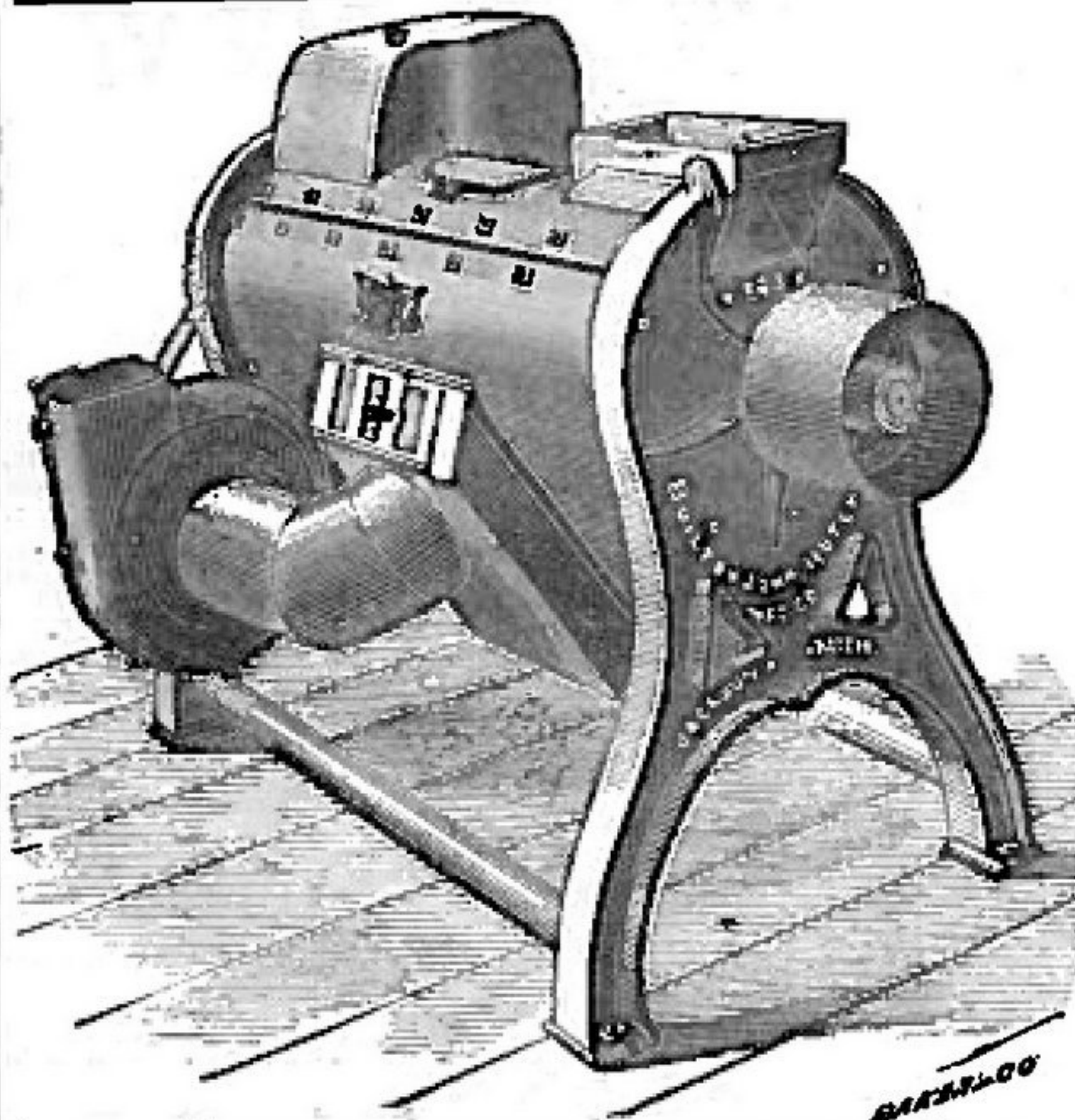
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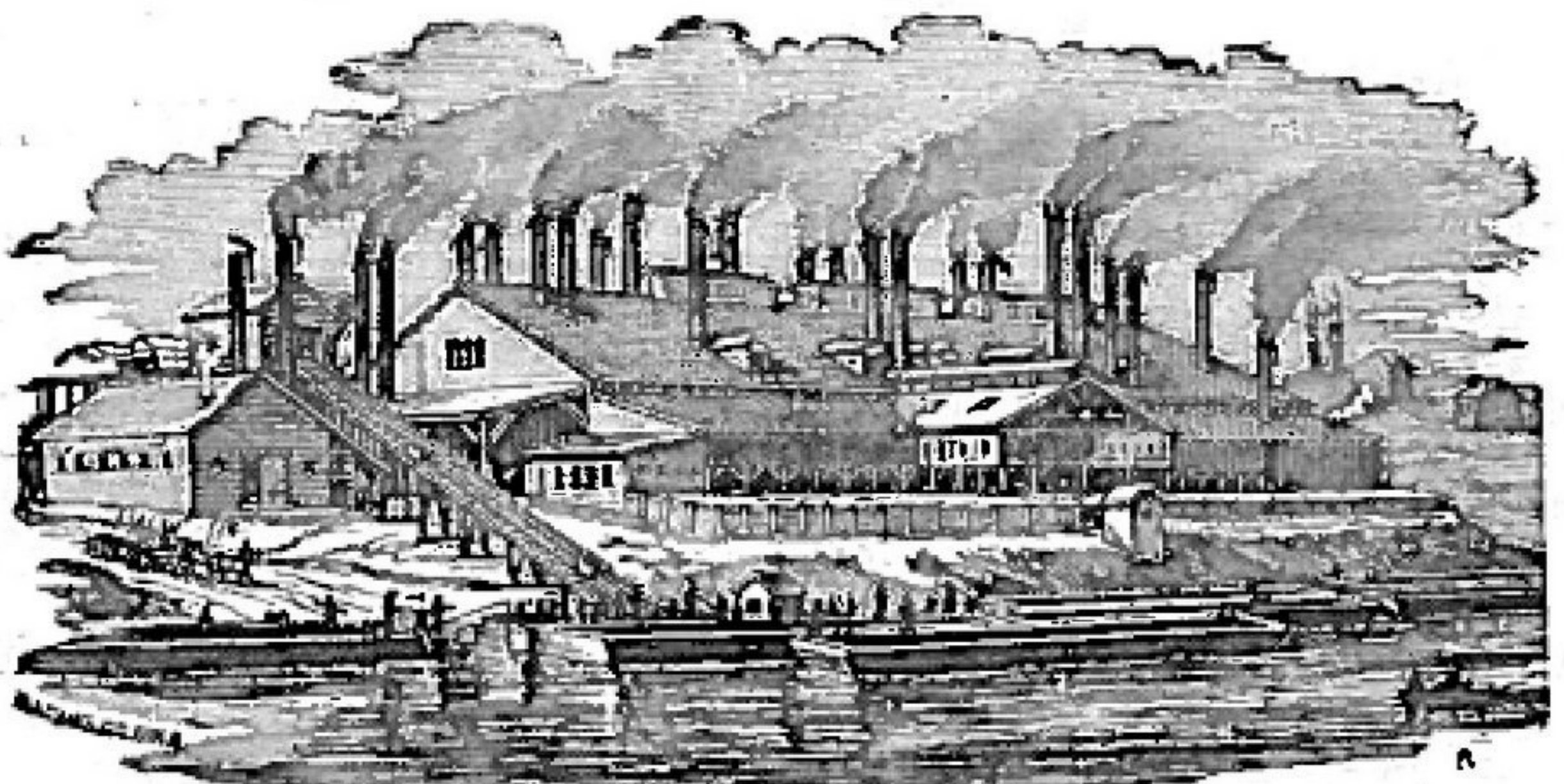
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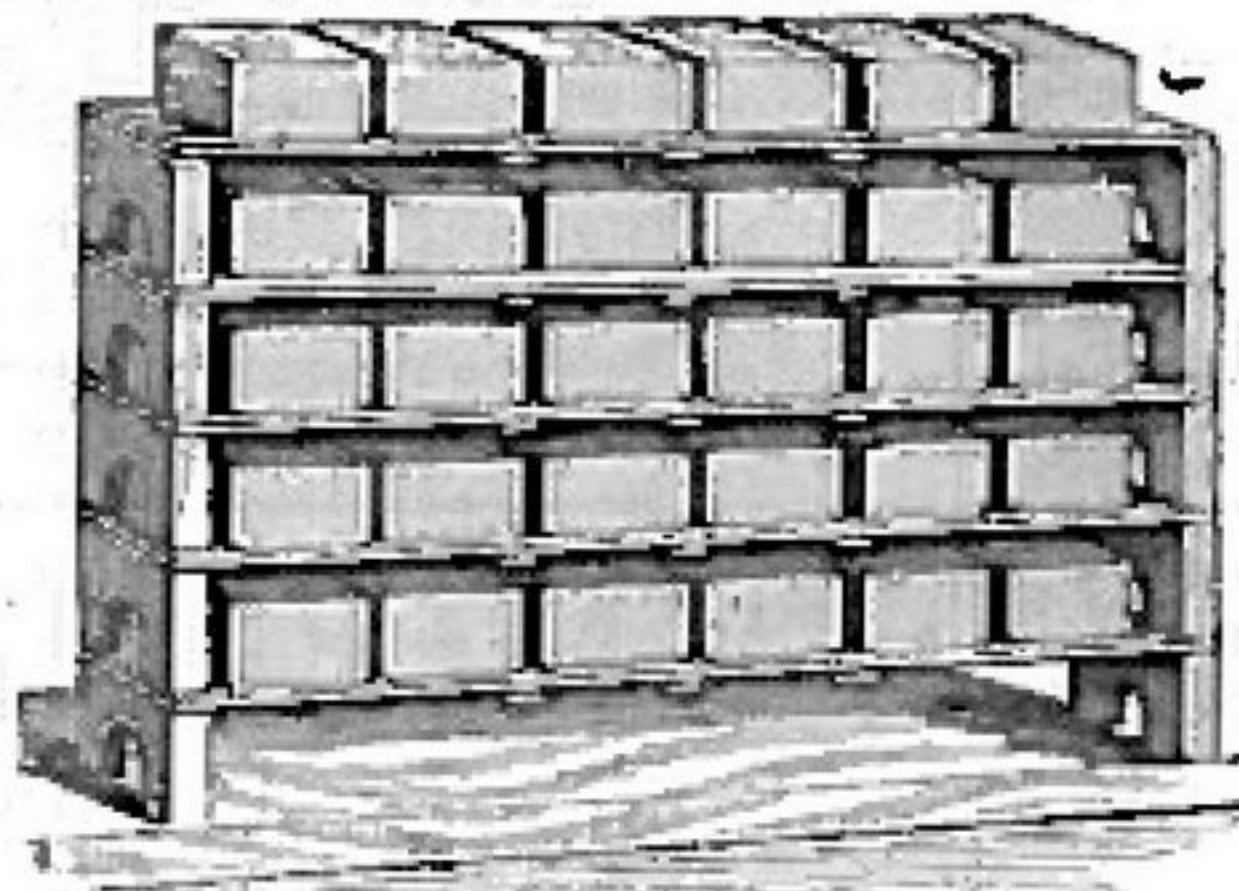
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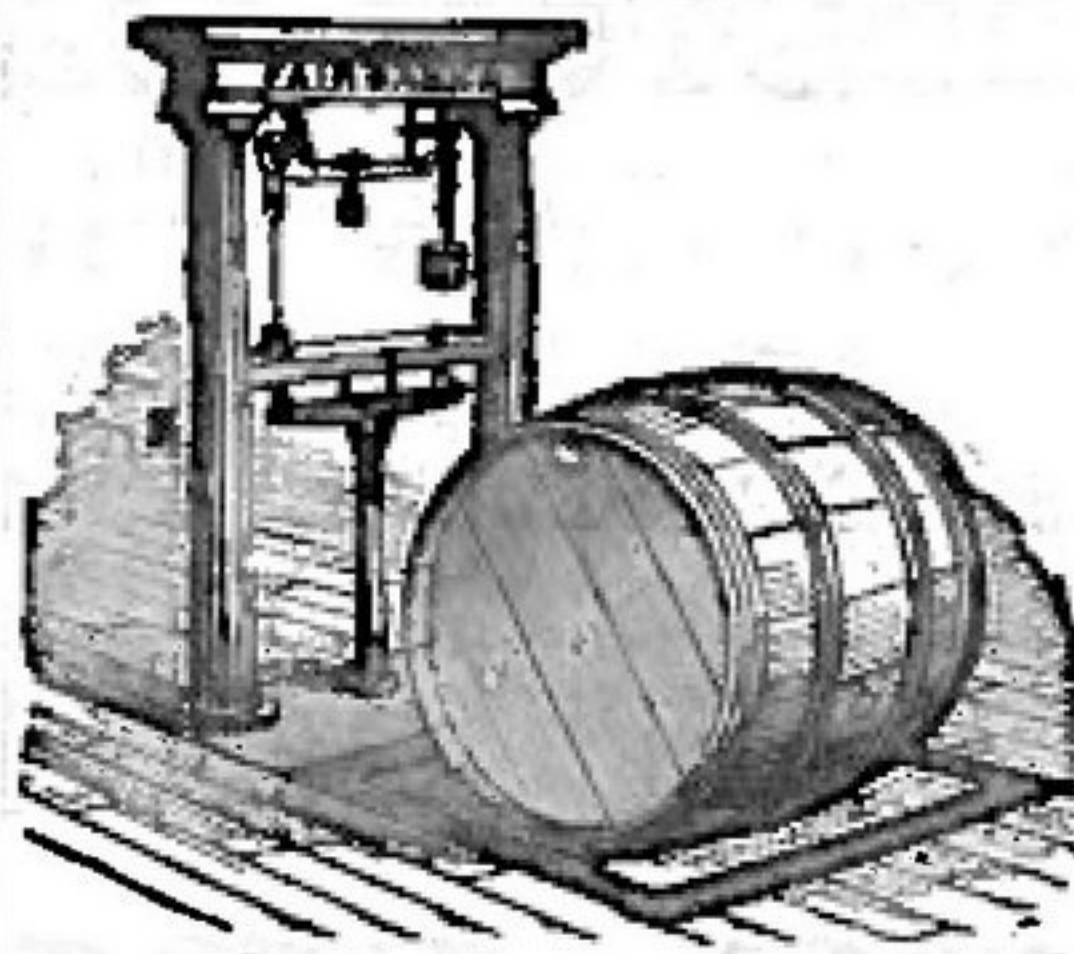
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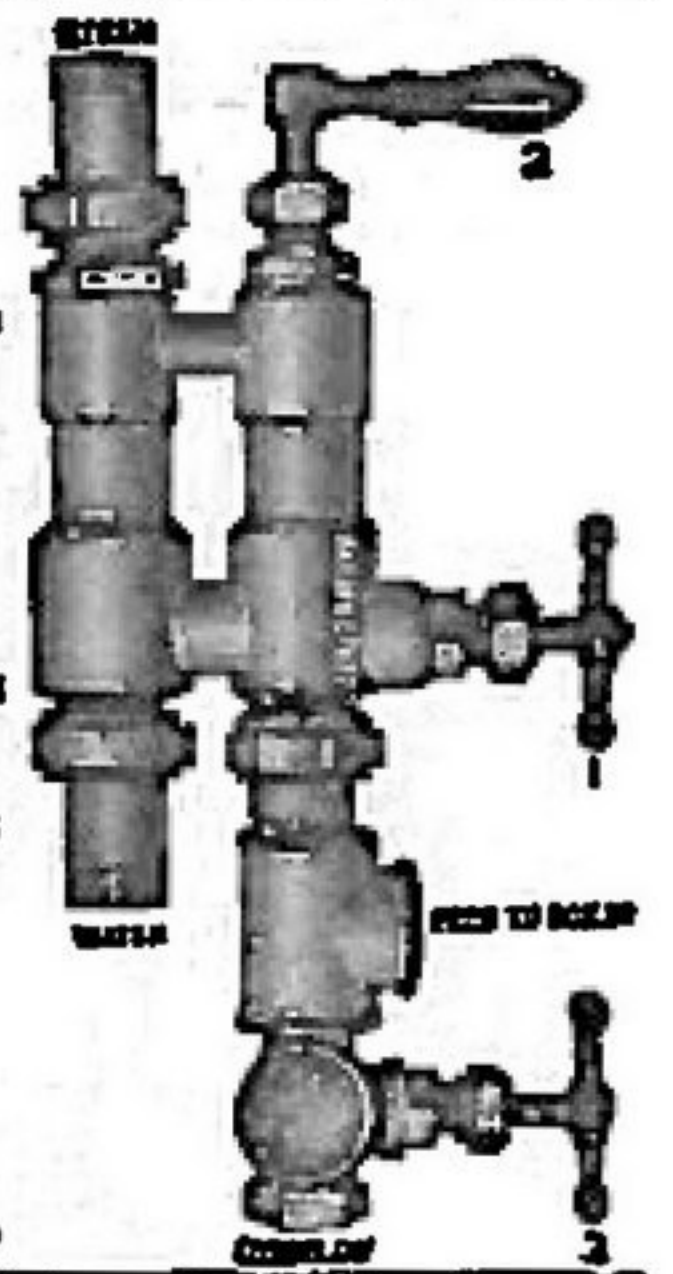
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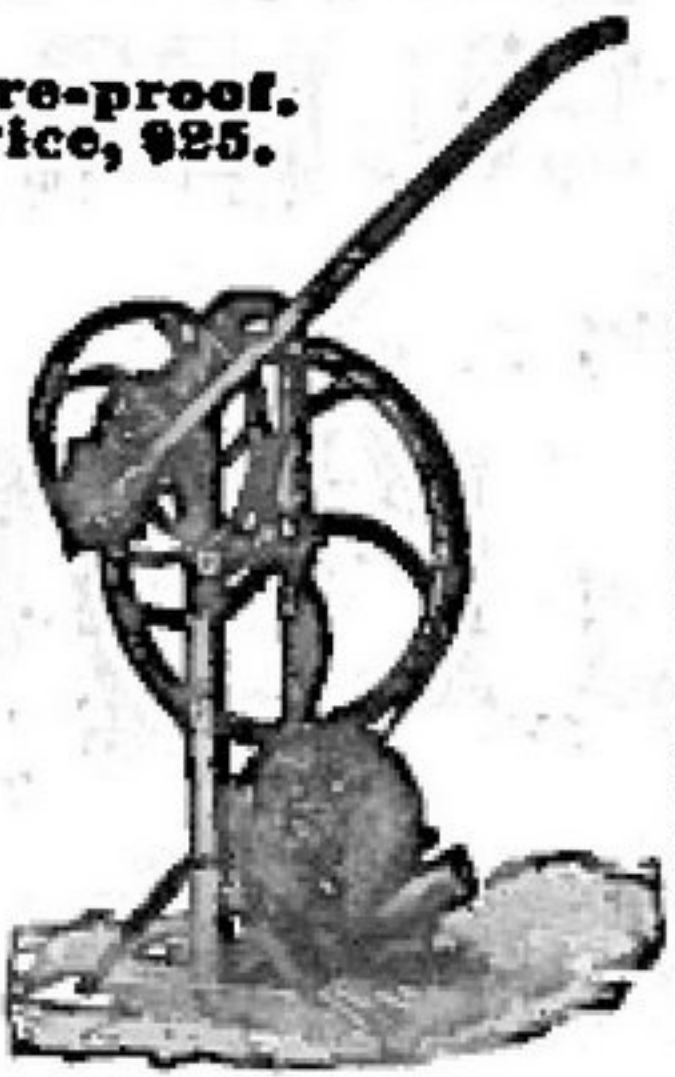
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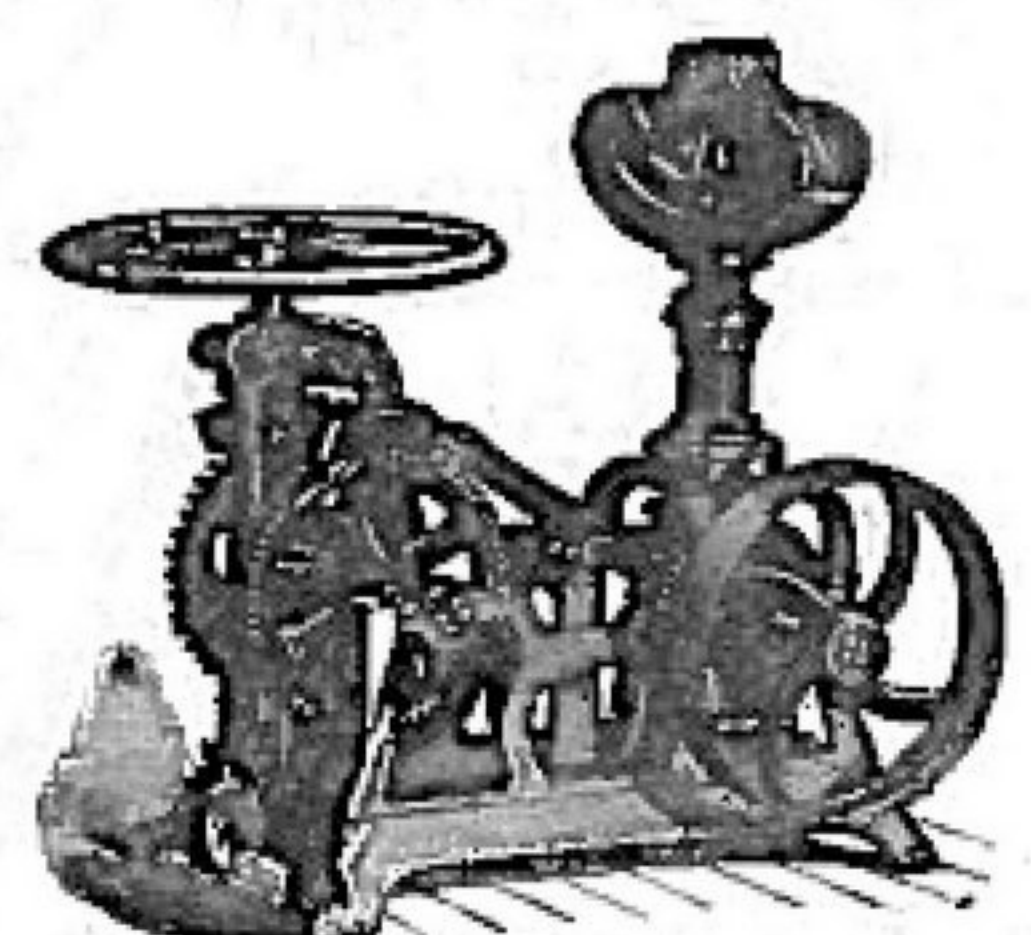
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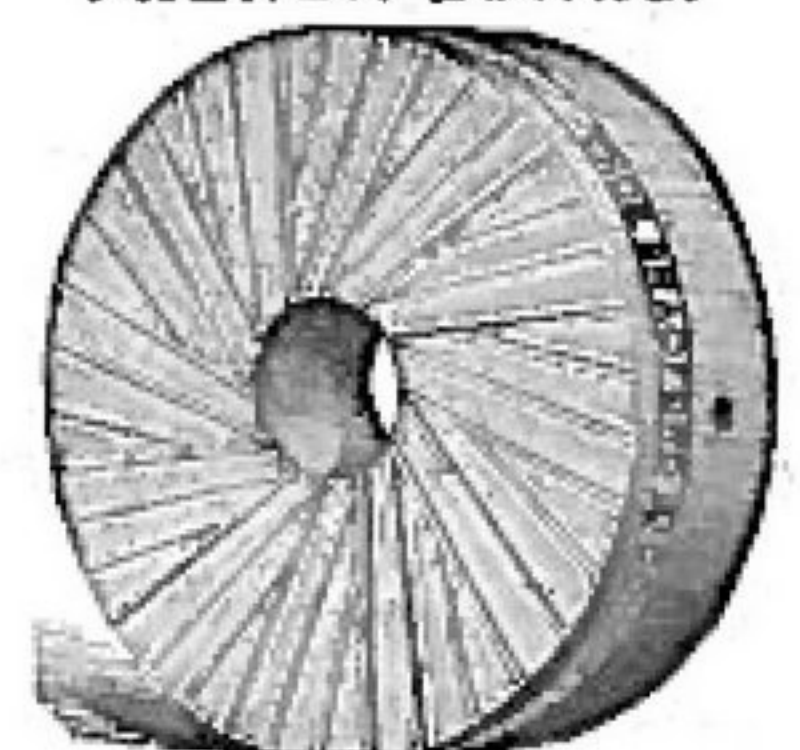
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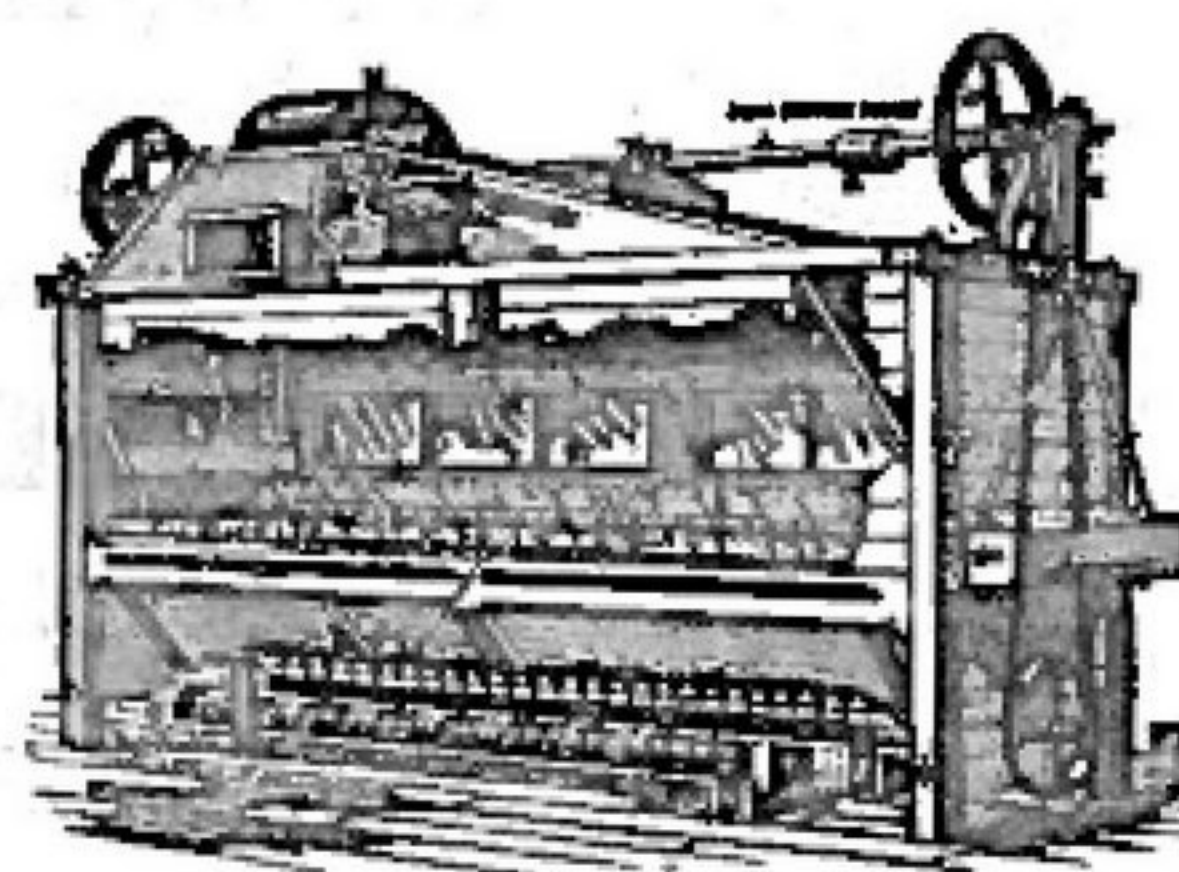
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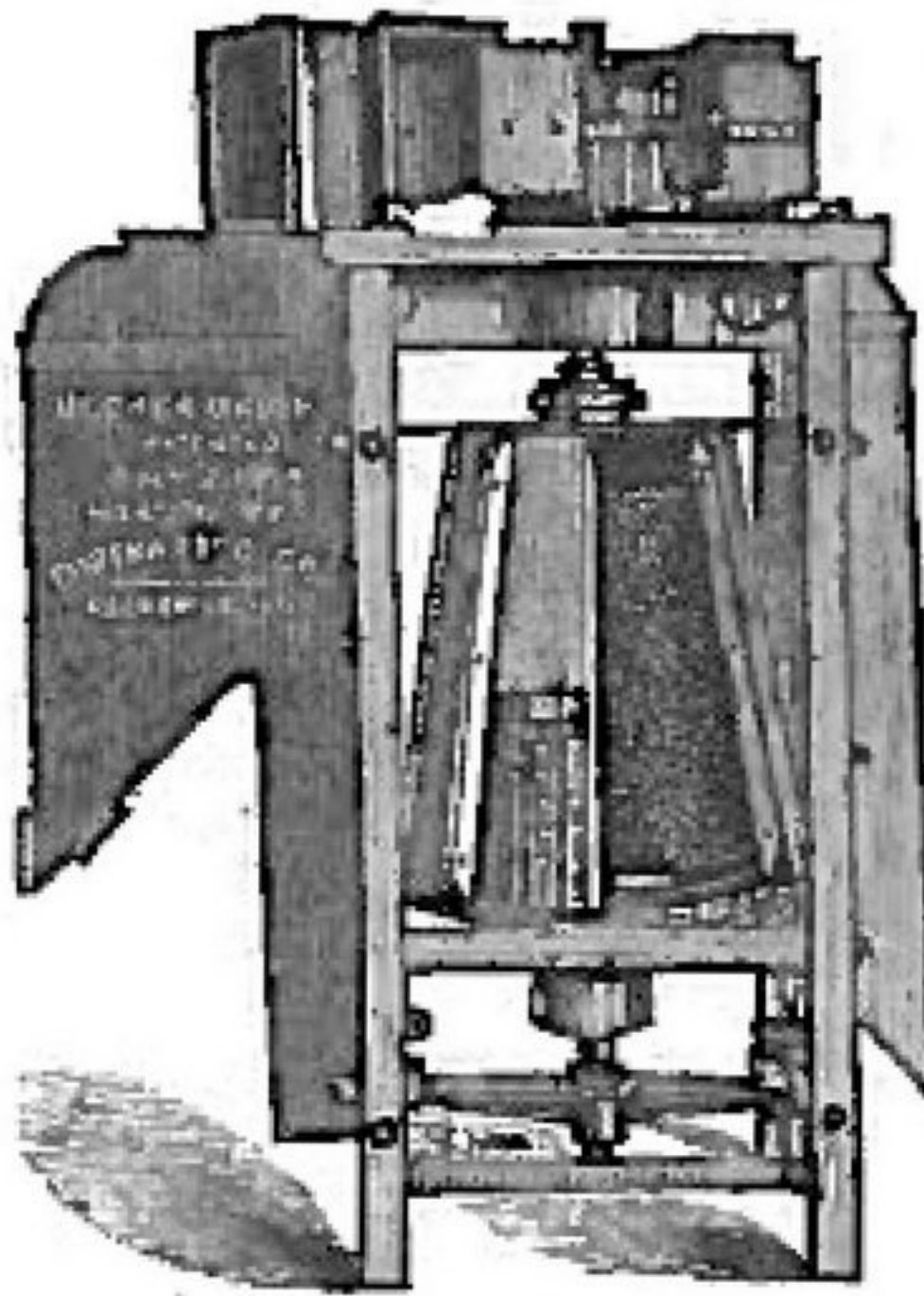
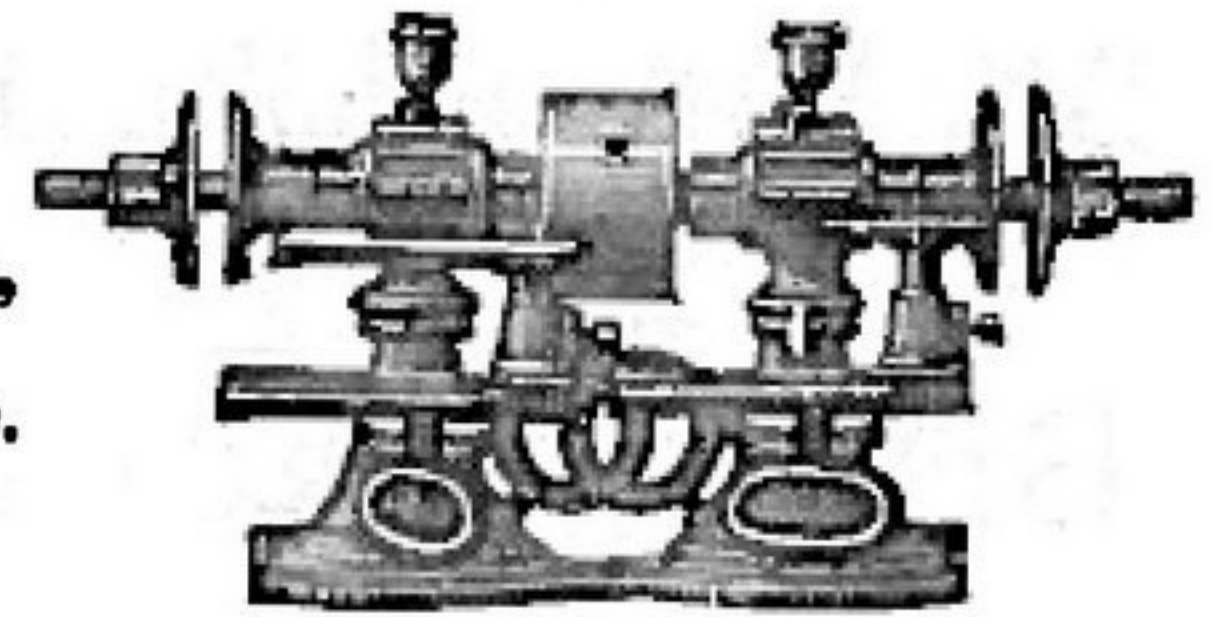
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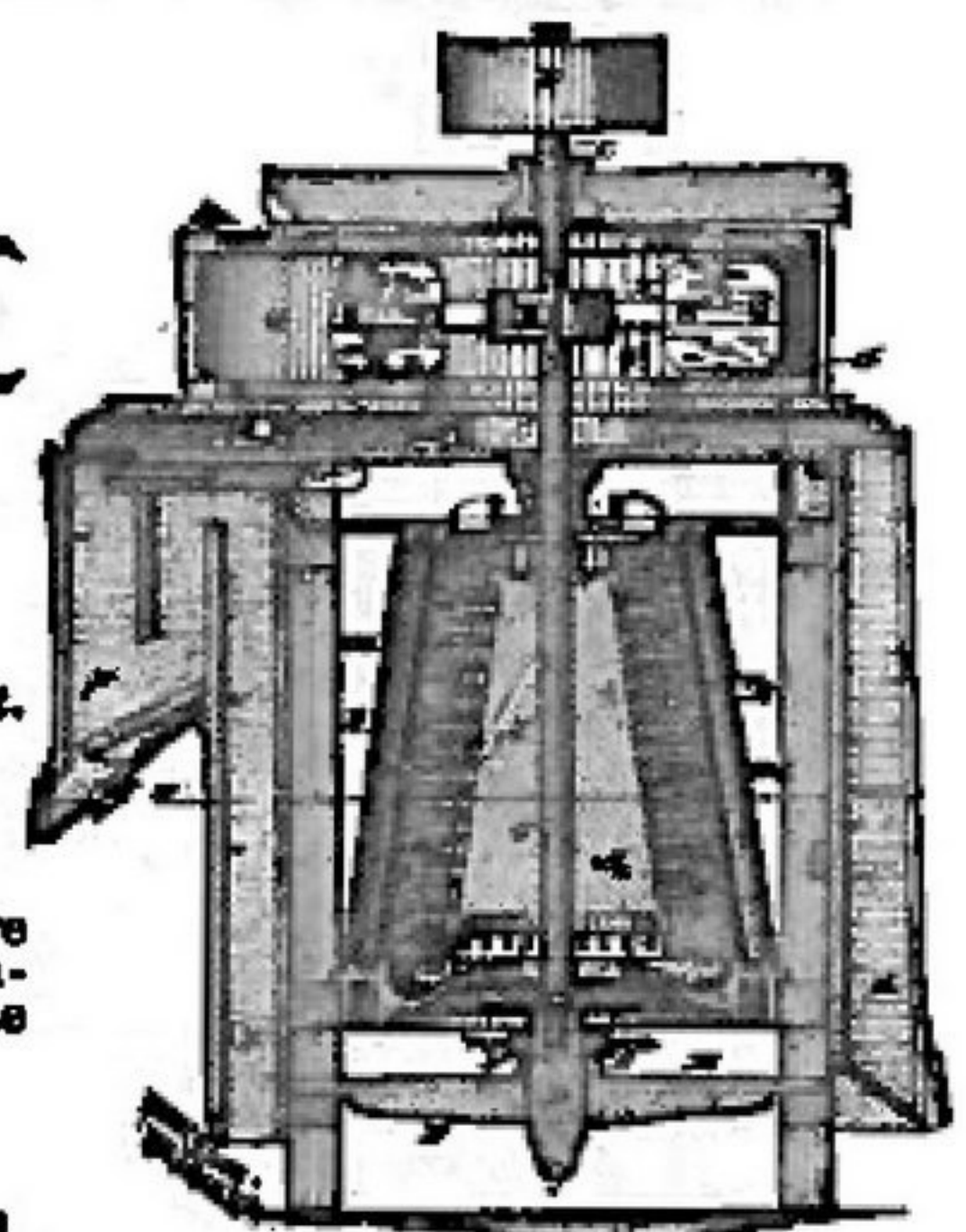
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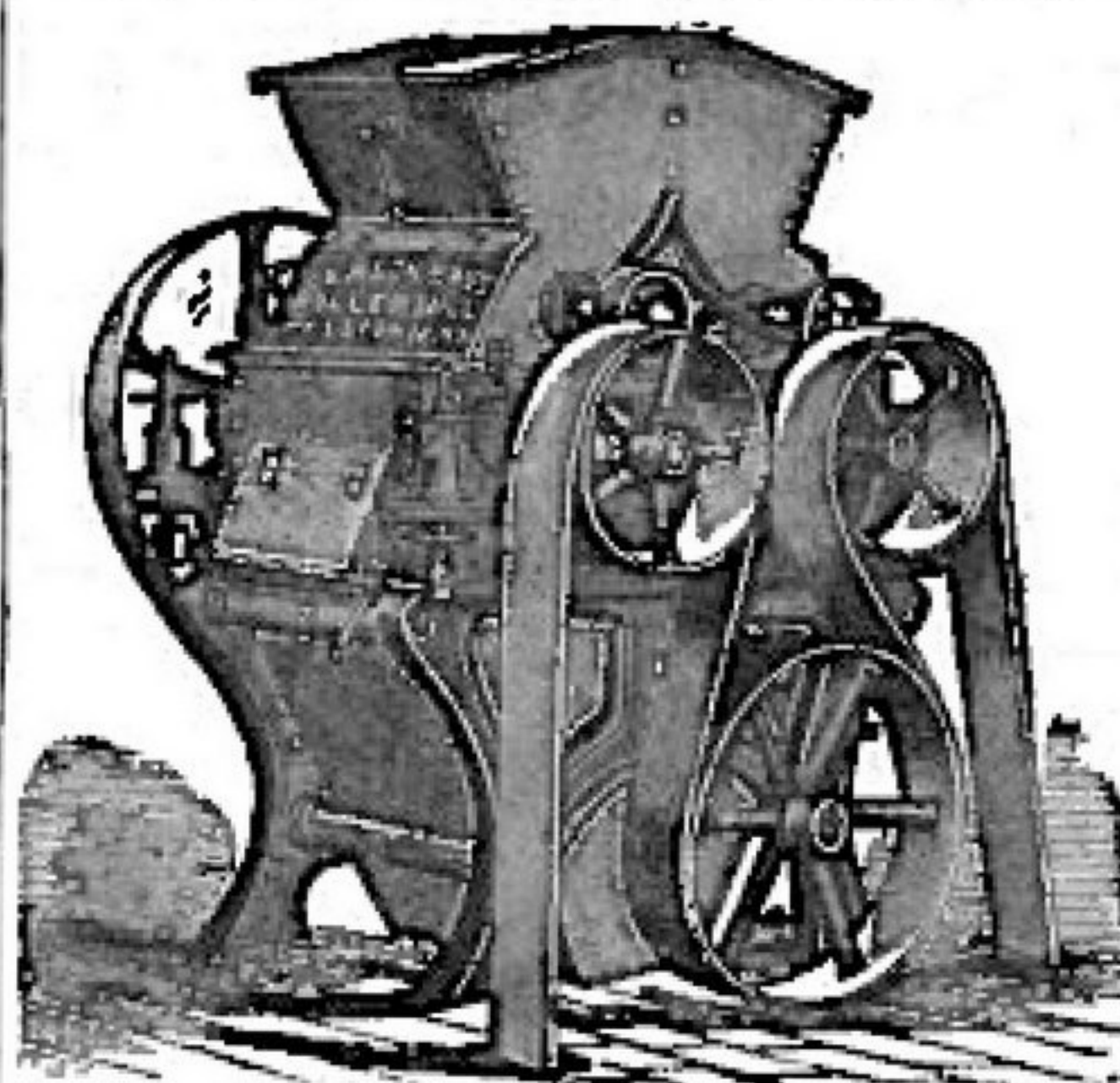
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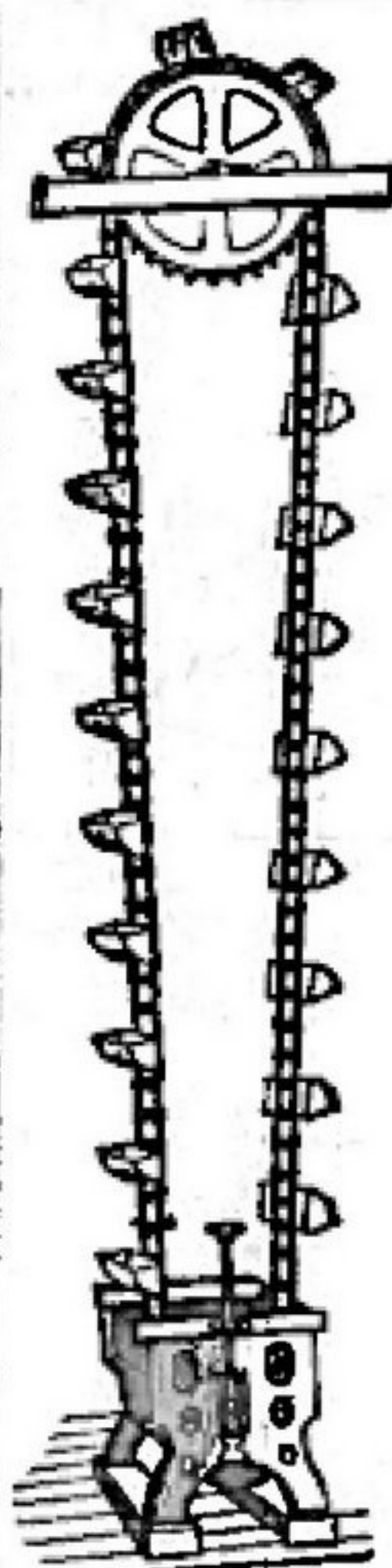
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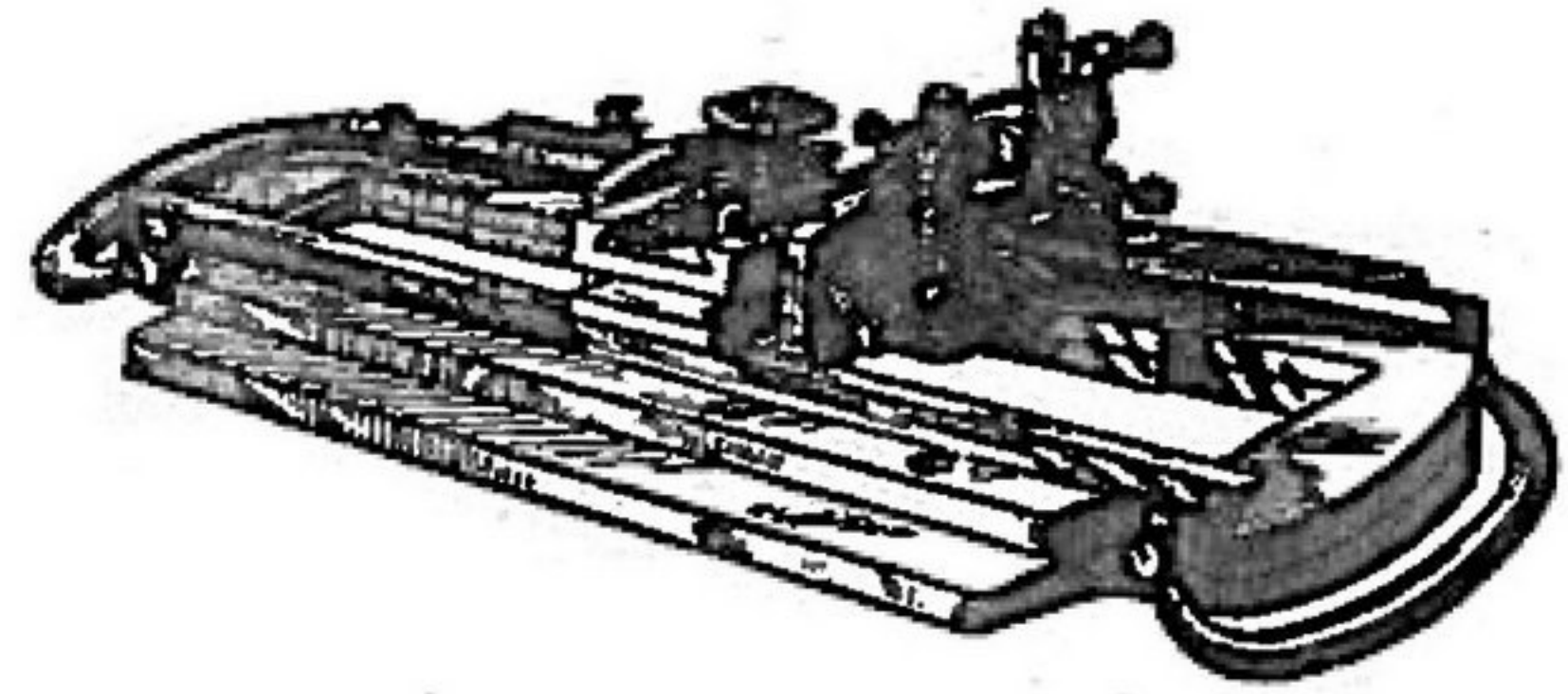
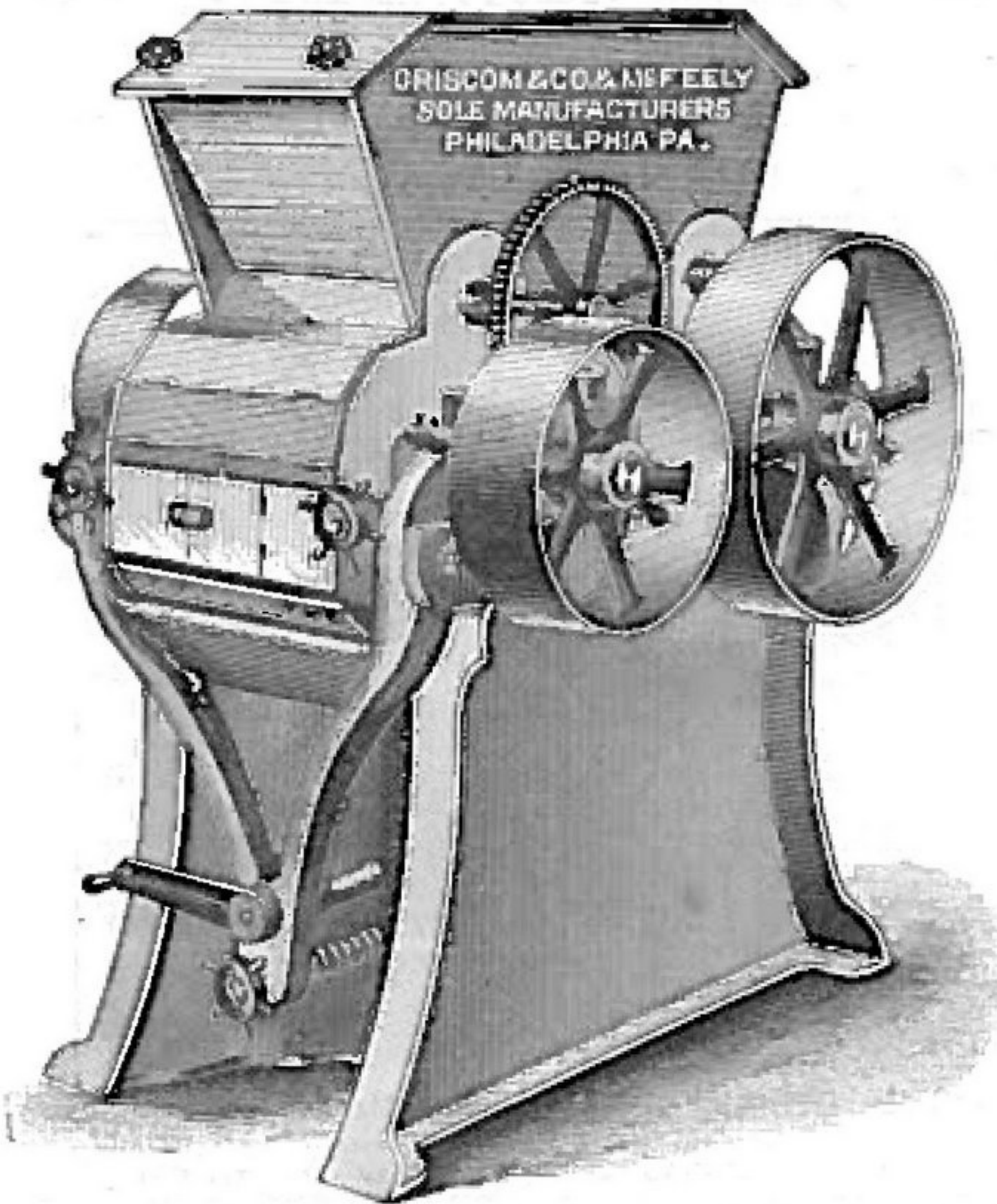
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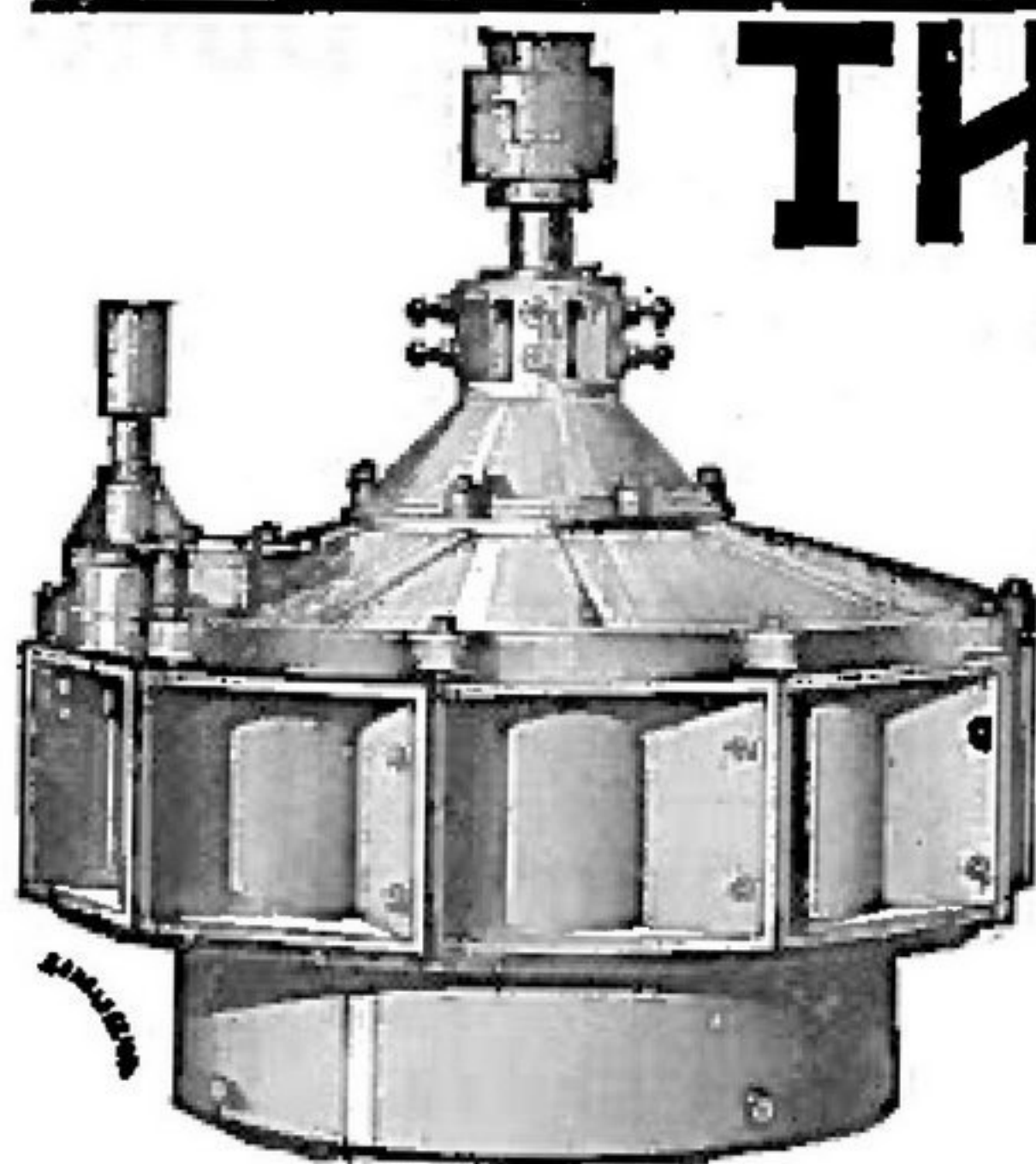
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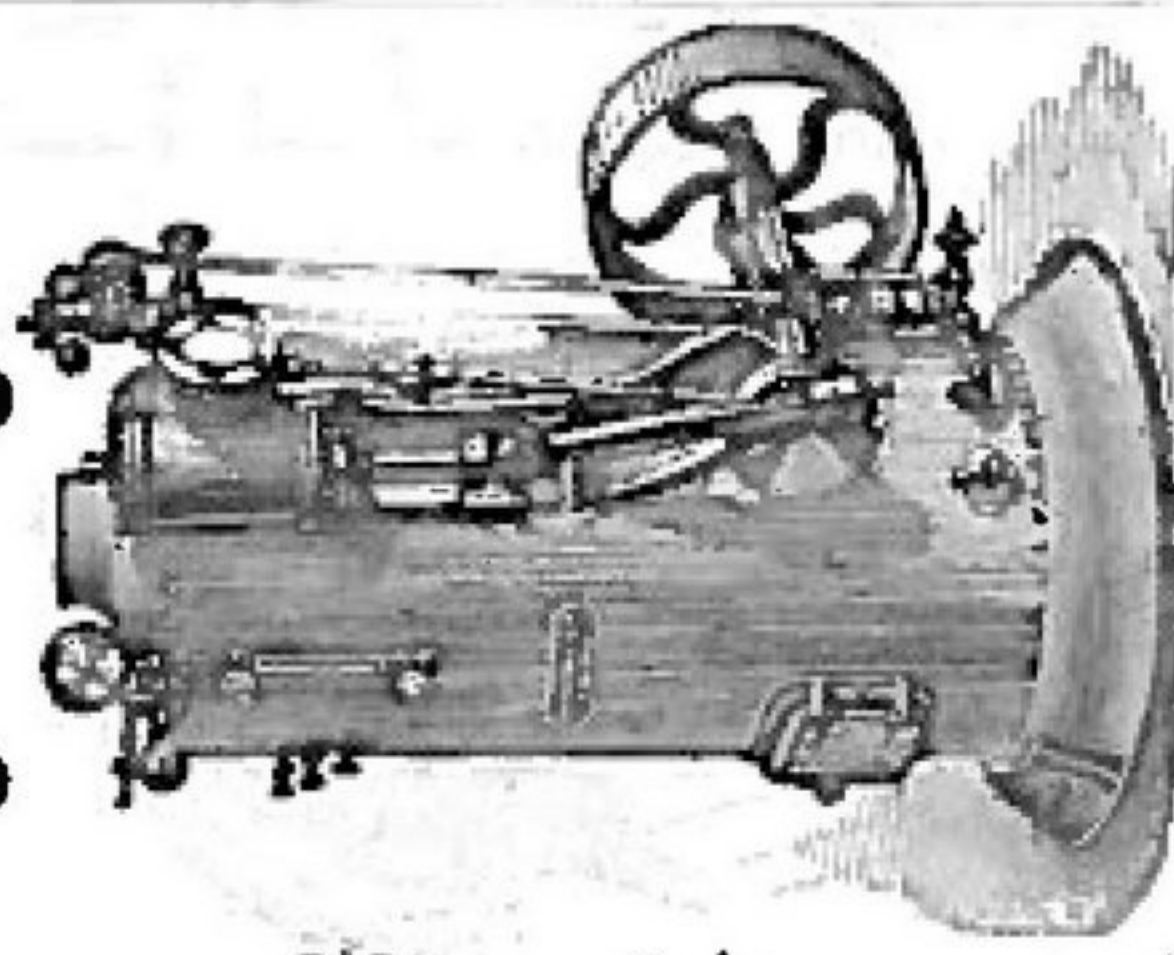
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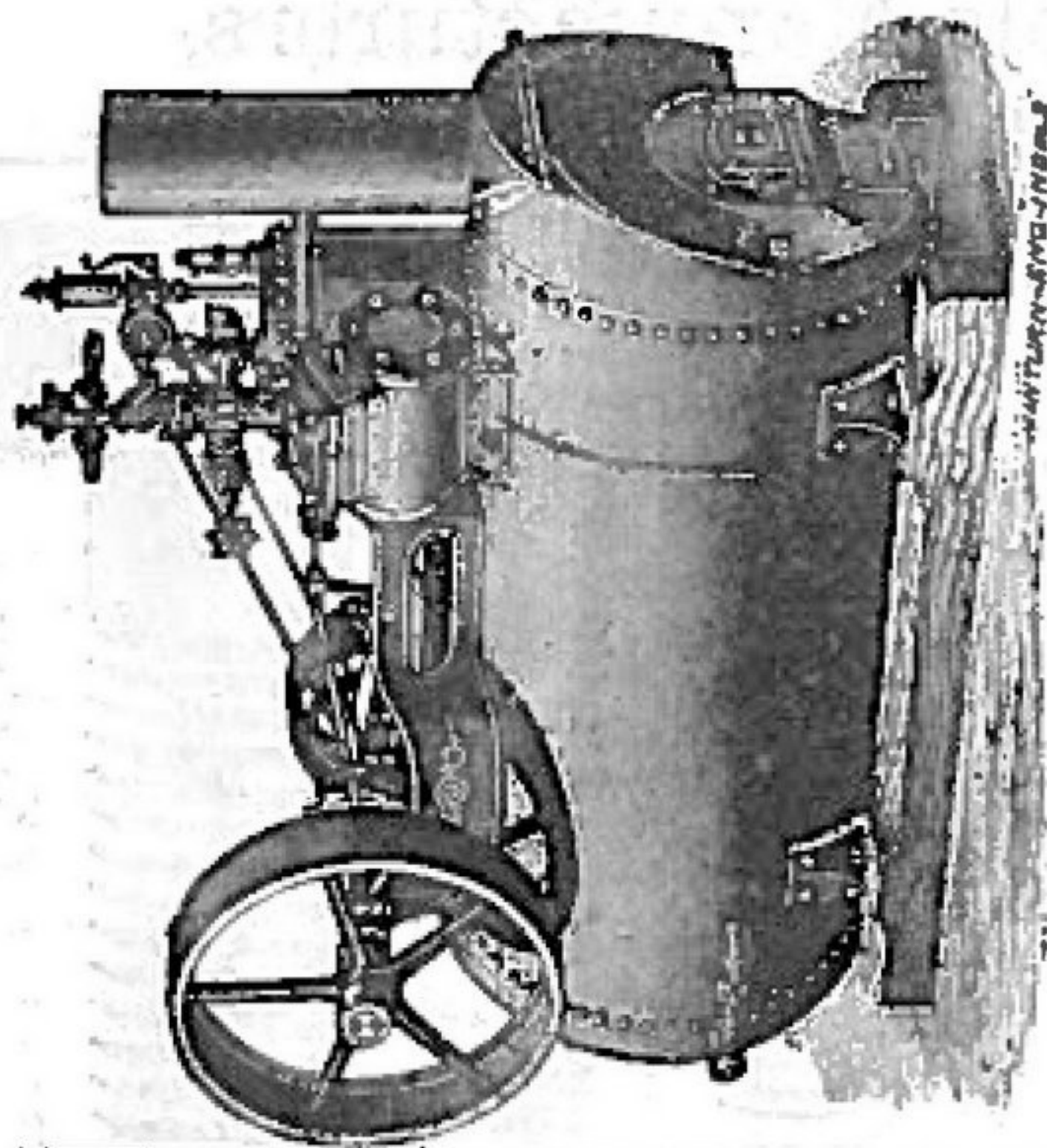
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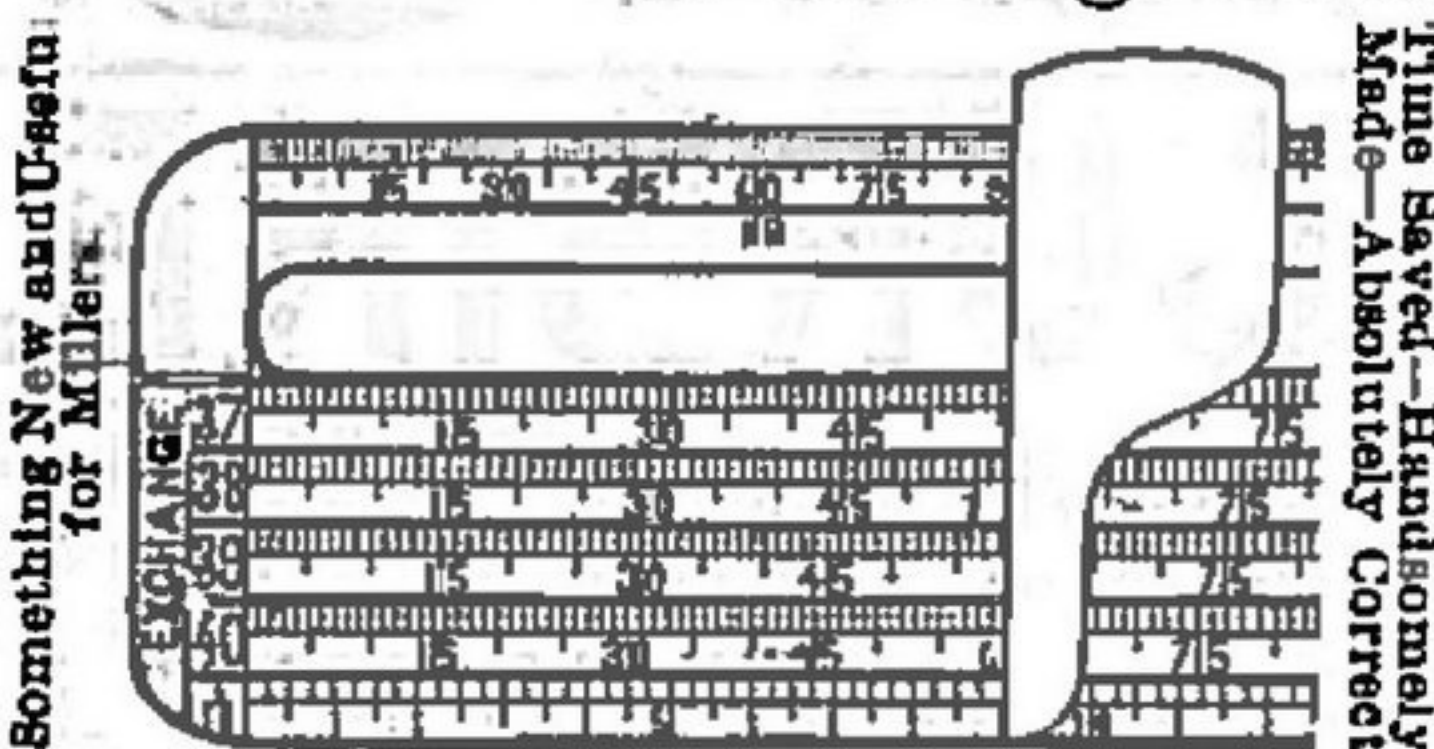
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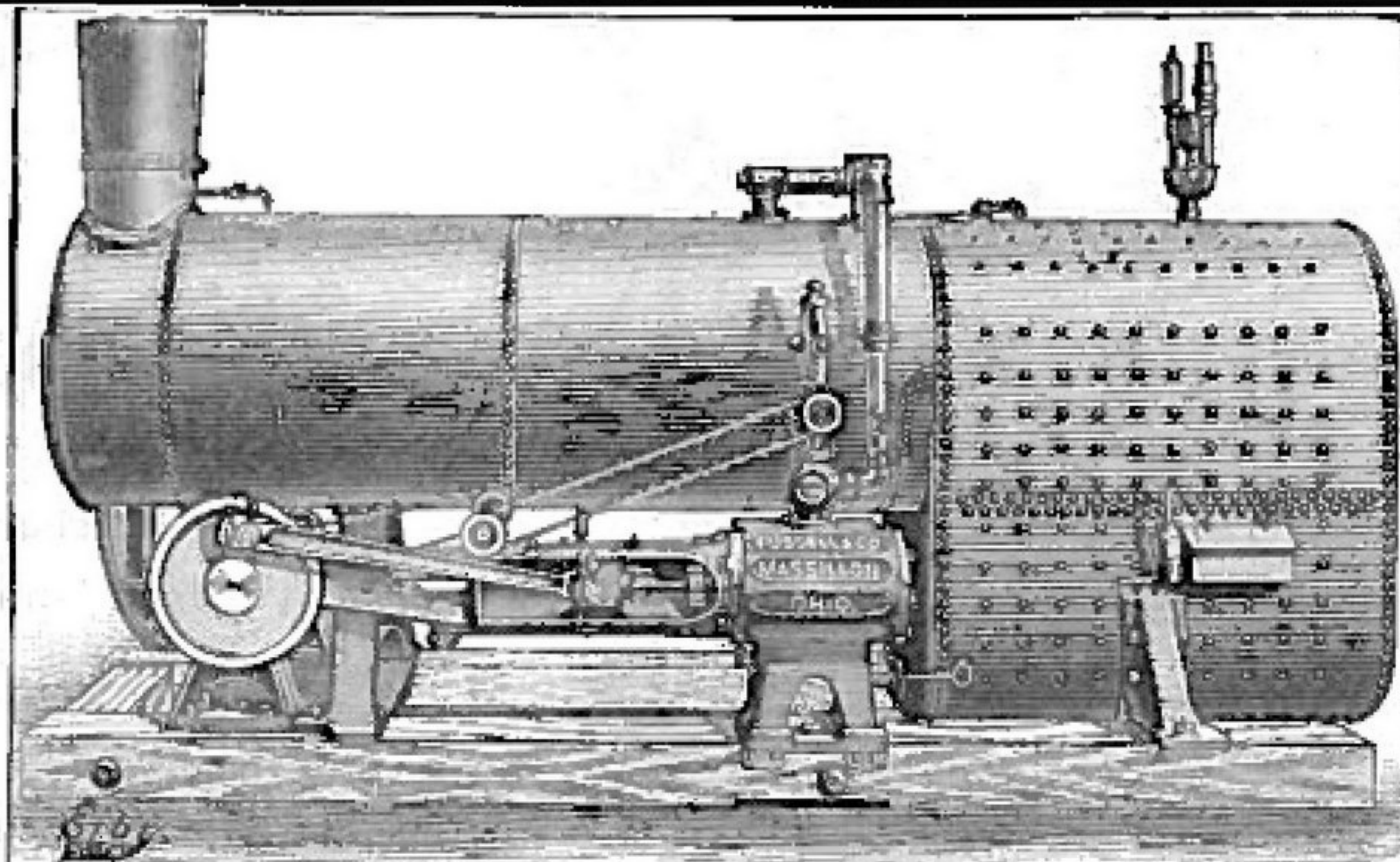


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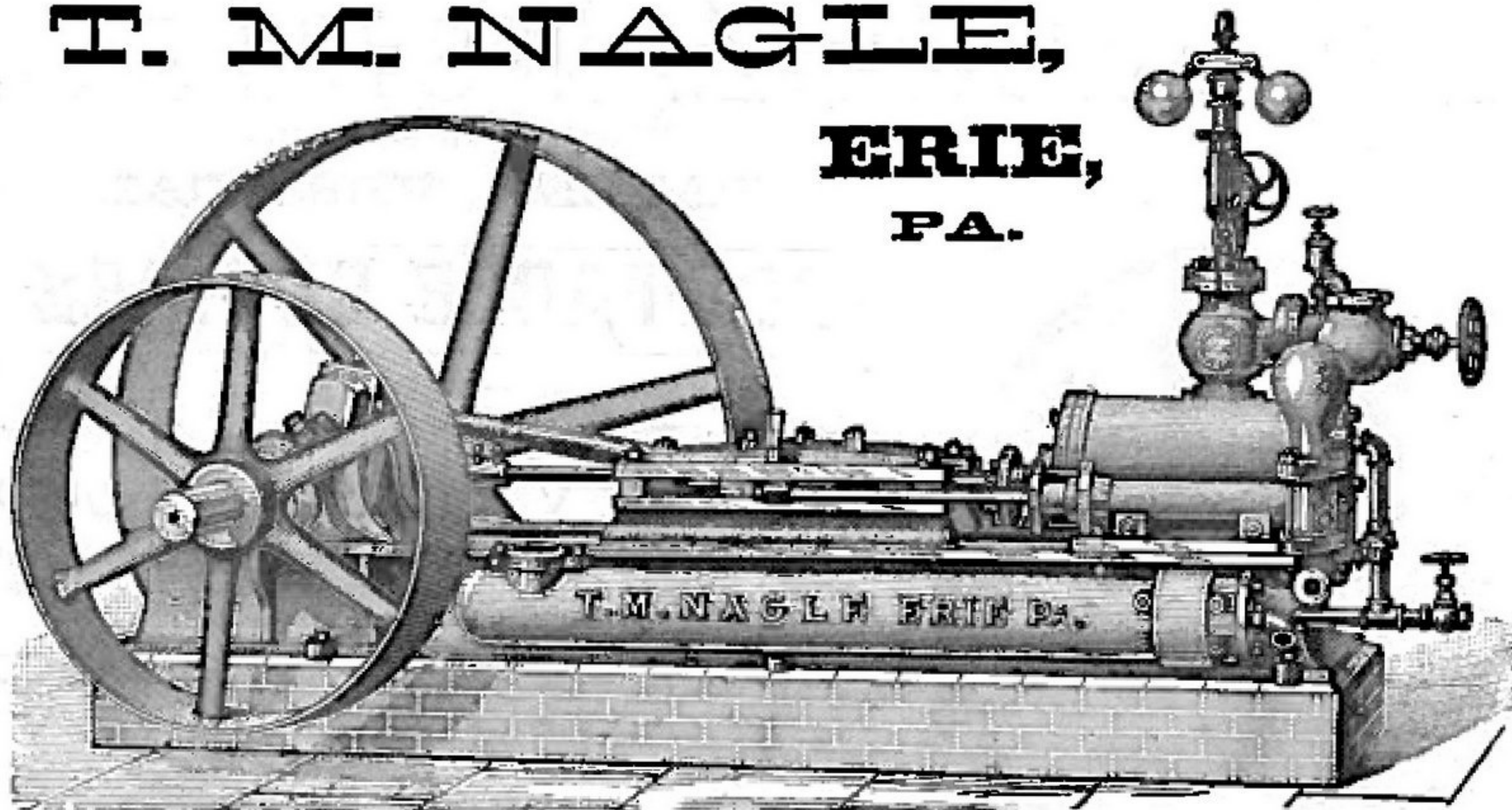
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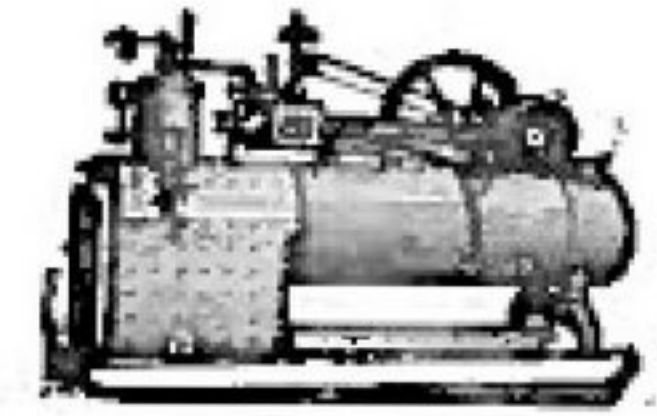
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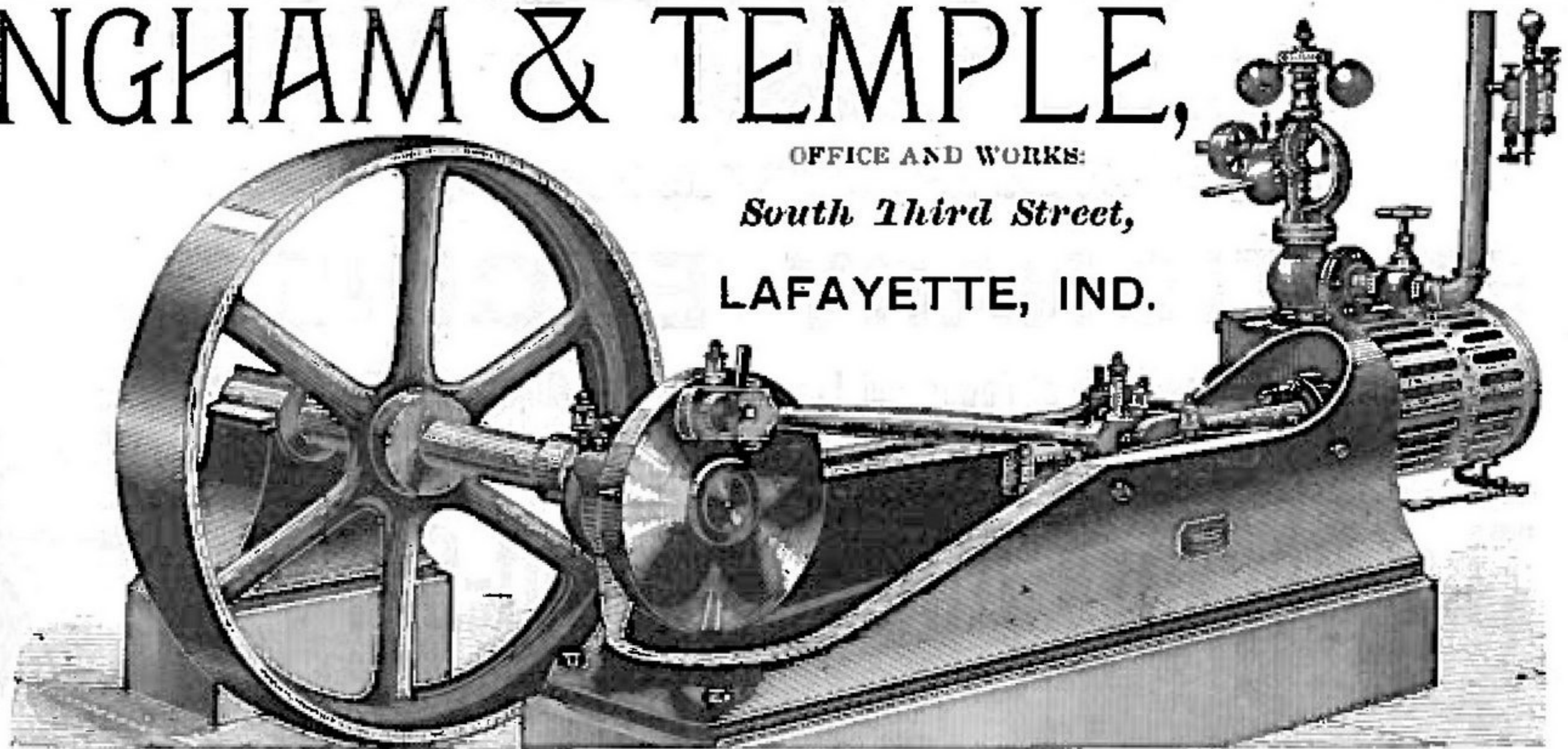


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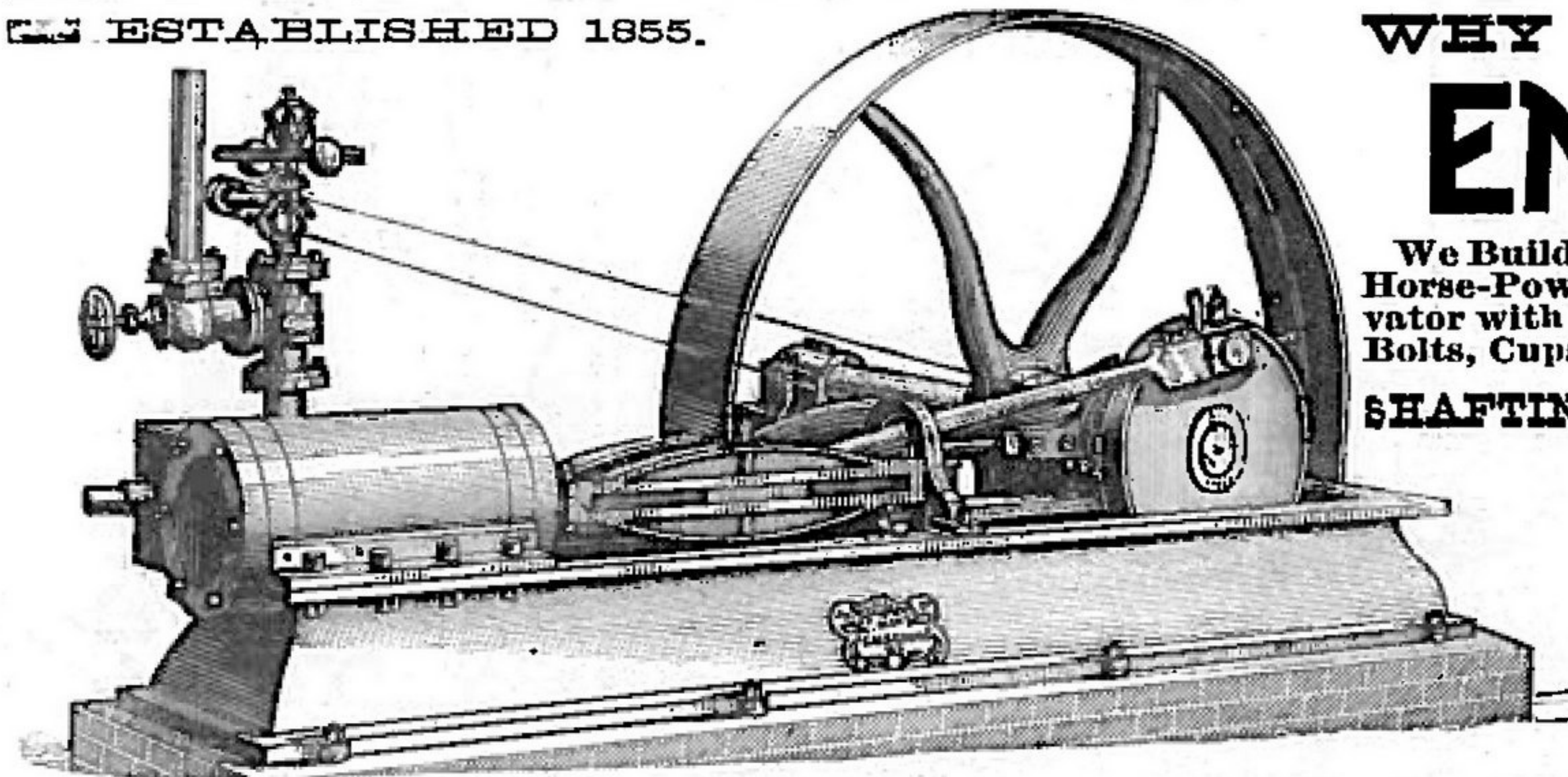
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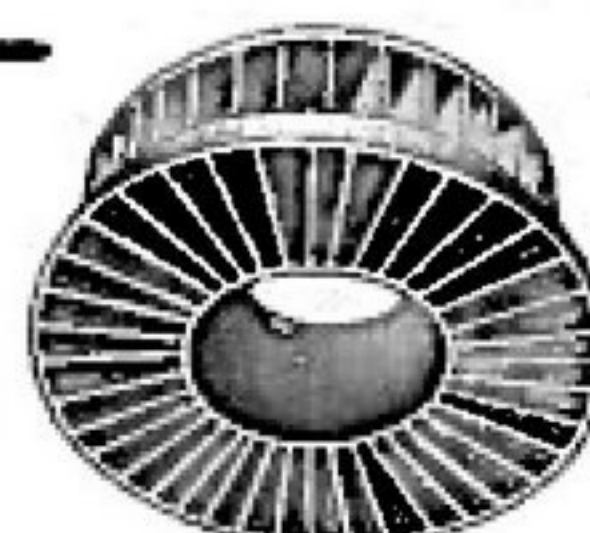
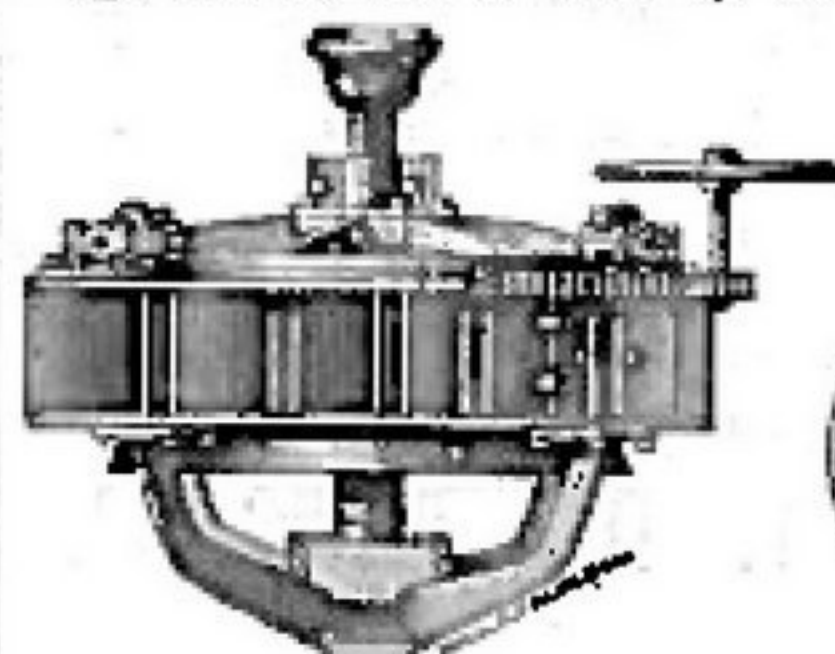
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GALESBURG, ILL.**

DeLOACH WATER WHEELS



From 2-10 to 2,000 horse power. Simplest, most durable, best gate for holding the water, fully equal in percentage of power to any wheel made, and price places it in reach of all. Send for illustrated catalogue. A. A. DeLOACH & SONS, Manufacturers, also of Milling Machinery, Atlanta, Ga. *Don't mention this paper.*

SWARTWOUT'S TURBINE WATER WHEEL!



FOUND AT LAST.
A Water Wheel that will give more power (other conditions being equal) according to the water used than any other wheel made.

It is provided with an adjustable throat, so as to give the power required, from a quarter to a full throat. **Sent on Thirty Days' Trial.** Send for prices.

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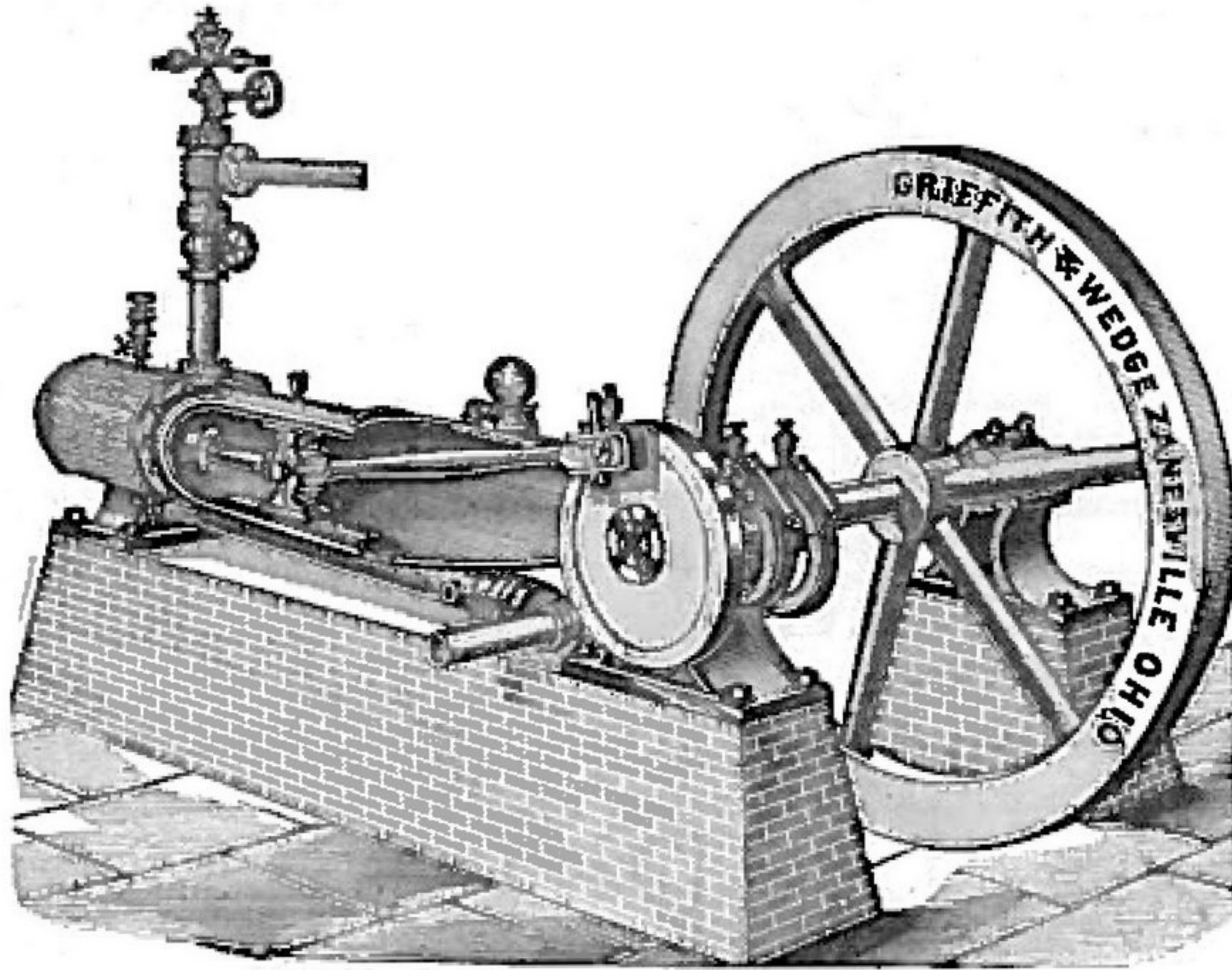
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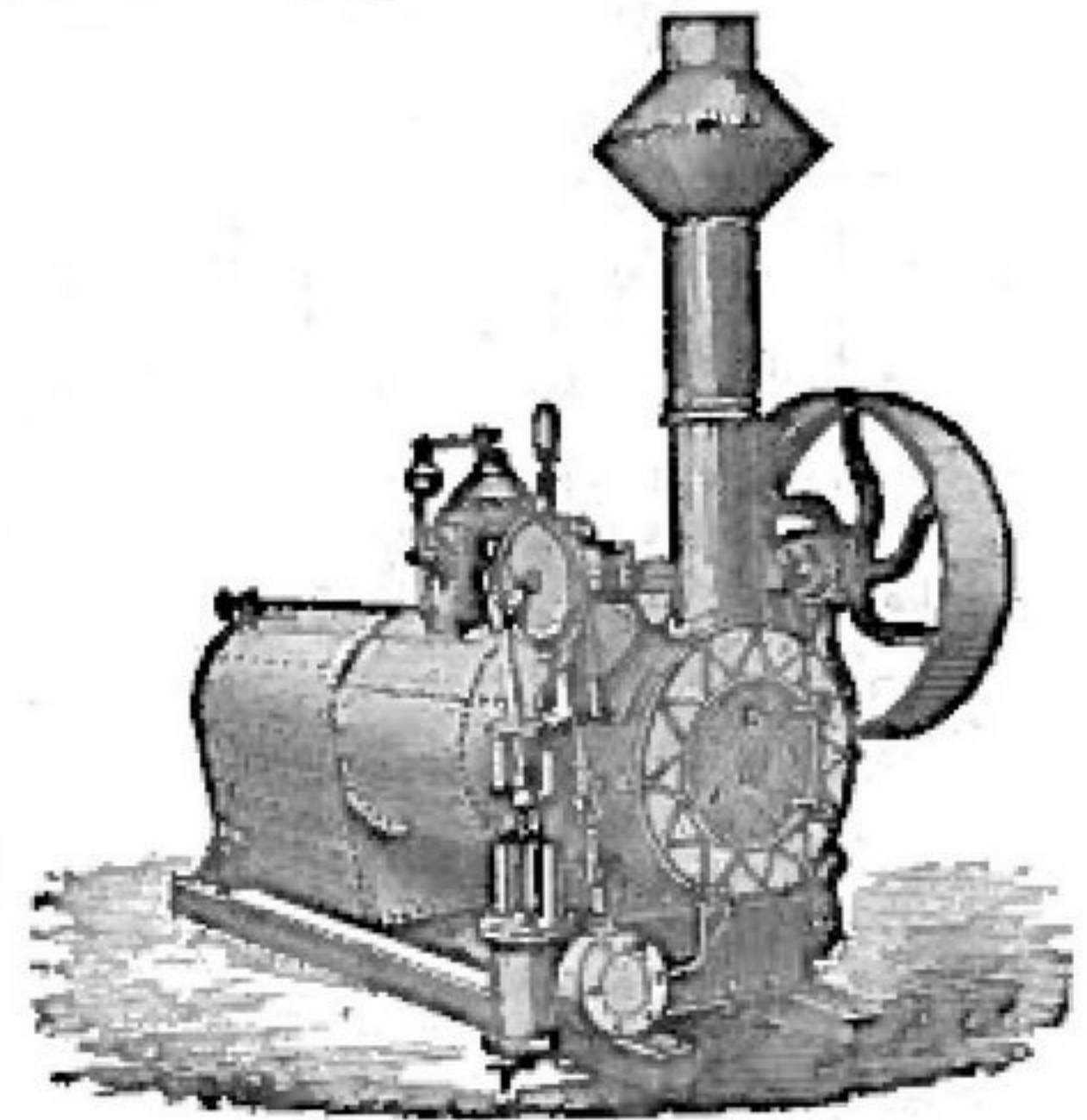


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Combining the Maximum of Power and Economy with the Minimum of Expense.

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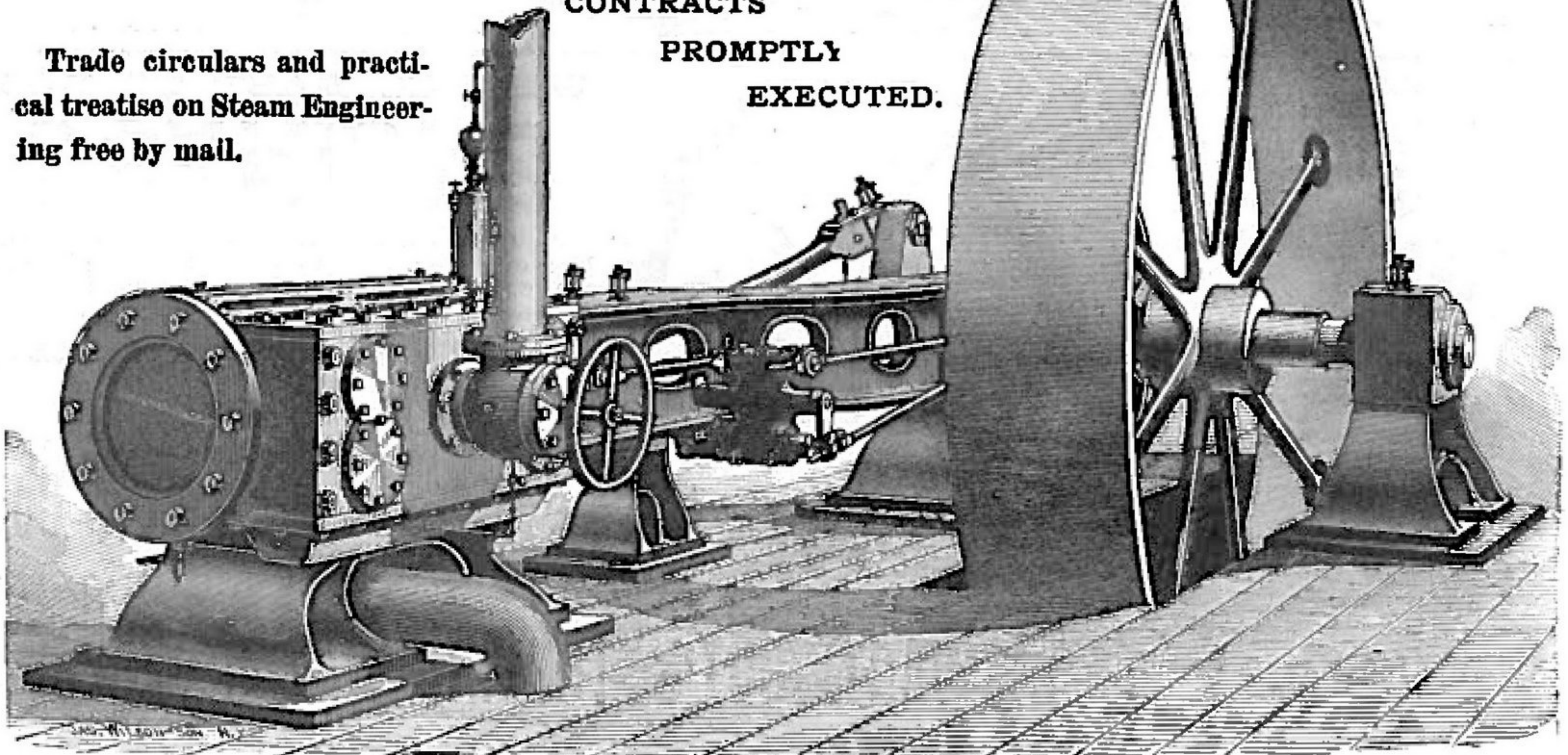
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PROMPTLY

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These engines are carefully constructed for heavy and continuous duty, at medium or high rotative speeds. Highest attainable economy in consumption of steam, and superior regulation guaranteed. Address

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THE CUMMER**AUTOMATIC
ENGINE**

Is Unequaled in Ease of Operation, Effective Duty, Close Regulation, in Quick Starting Up to Speed, Uniformity of Speed and Economy of Fuel.

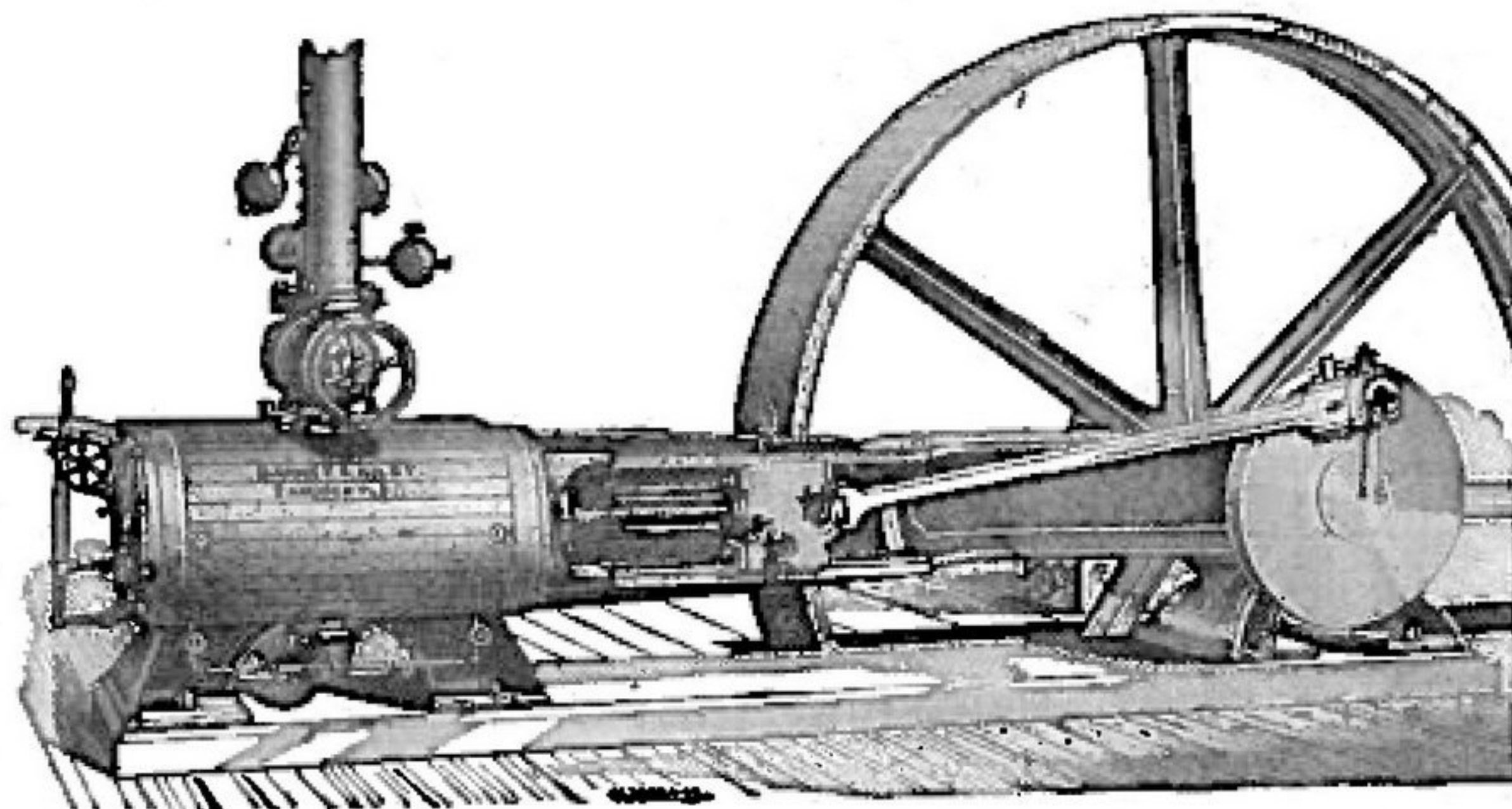
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These are Points of Importance with every Miller and Manufacturer who Expects Prompt, Even Duty of an Engine

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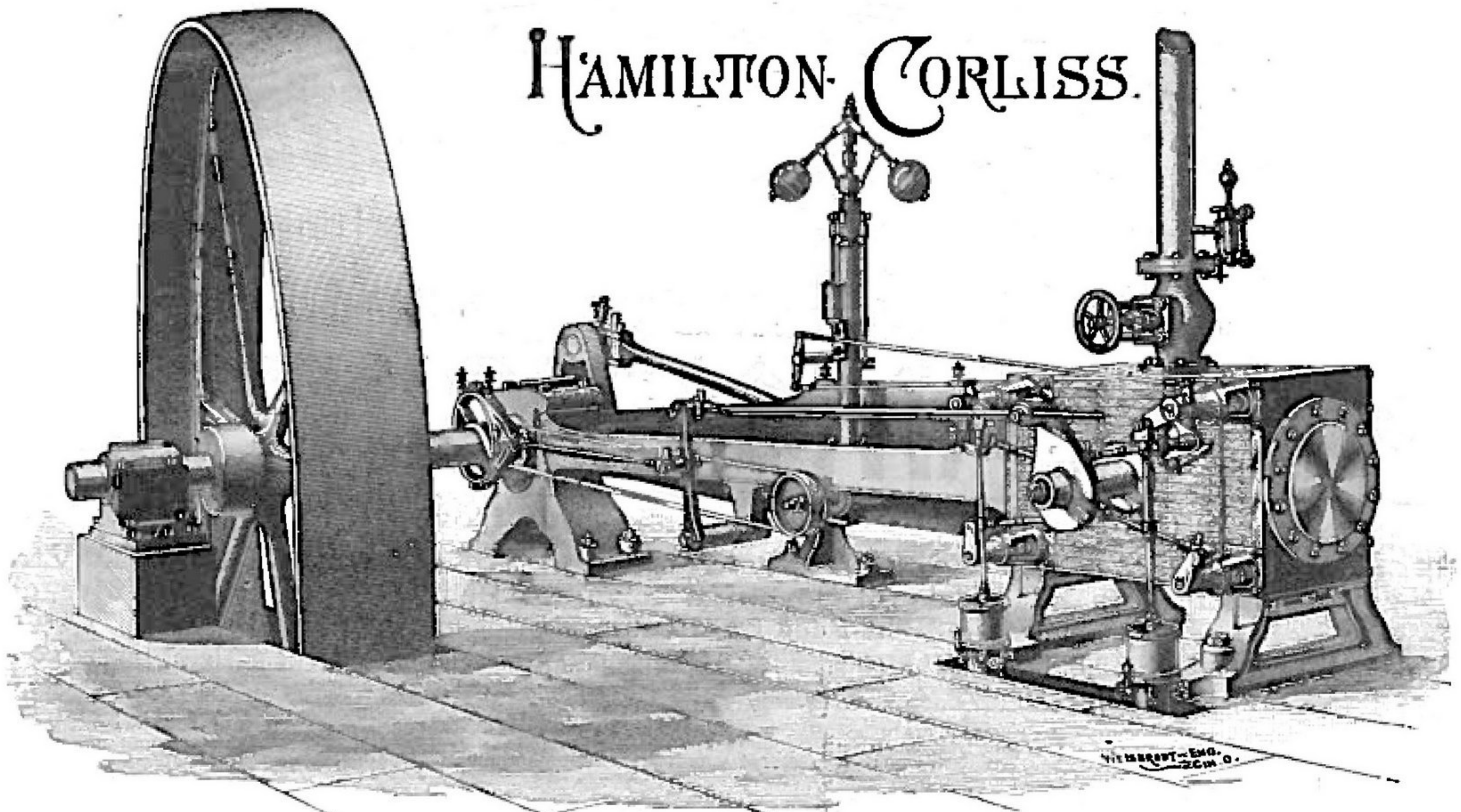
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Machinists,
MILL BUILDERS
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FURNISHERS.
SANDUSKY, O.**

Good proportions, symmetrical outlines, good material, superior workmanship, easy access to all parts, smooth running, and economy in steam consumption are the features we claim for this Engine.

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**CLOSE REGULATION AND BEST ATTAINABLE ECONOMY OF FUEL AND STEAM.
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THE HOOVEN, OWENS & RENTSCHLER CO.,

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THE IDE AUTOMATIC ENGINE

Superior Construction.

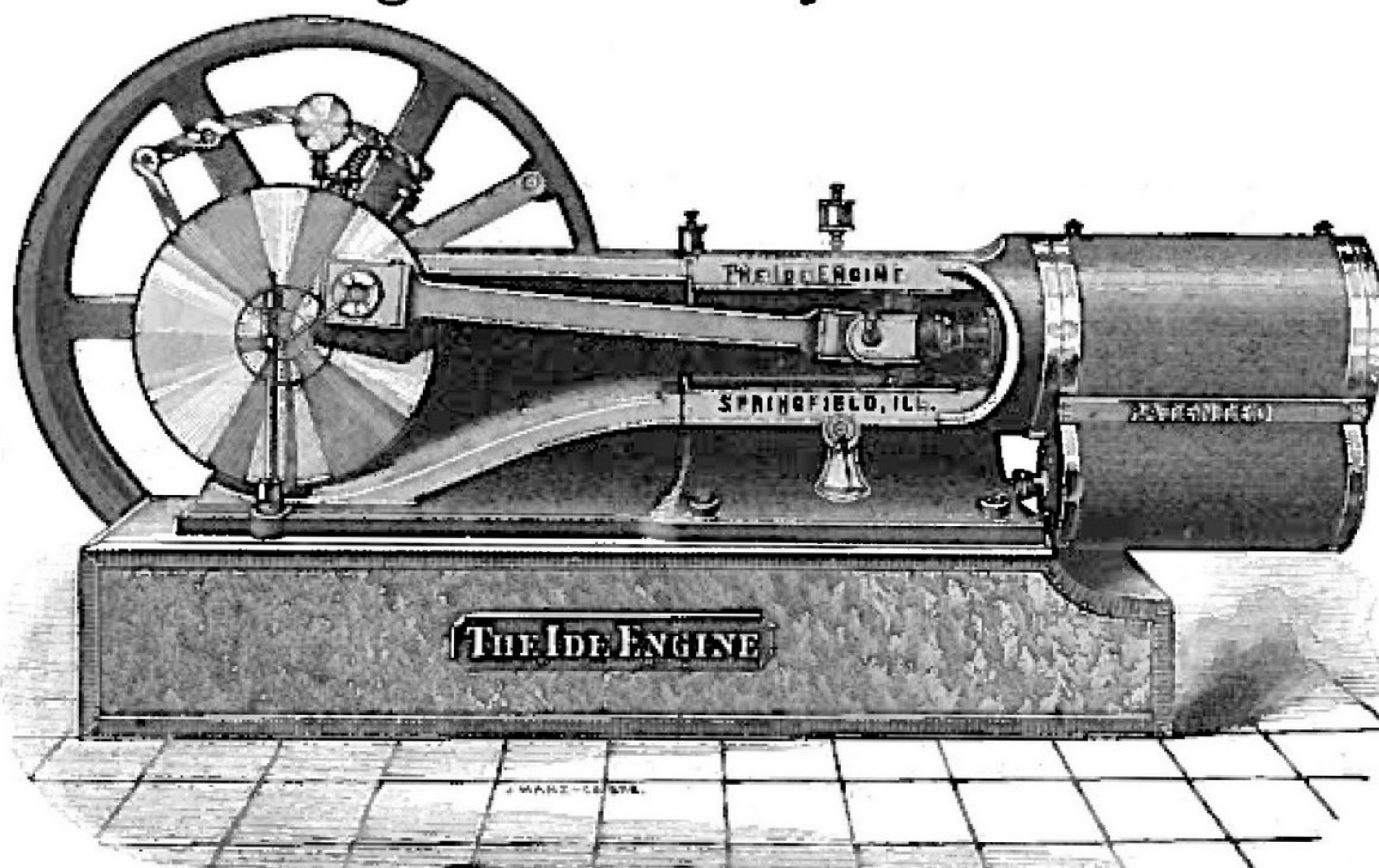
Perfect Regulation.

Highest Economy in Fuel.

ALL WORKING PARTS OF STEEL.

ROLLERS MILLS.

SPECIALY ADAPTED FOR



The Amount of Power Being Used.

ENGINE INDICATES

AT ALL TIMES

I also make superior FEED-WATER HEATERS and PURIFIERS and BOILER FEEDERS.

Send for Illustrated Descriptive Catalogue.

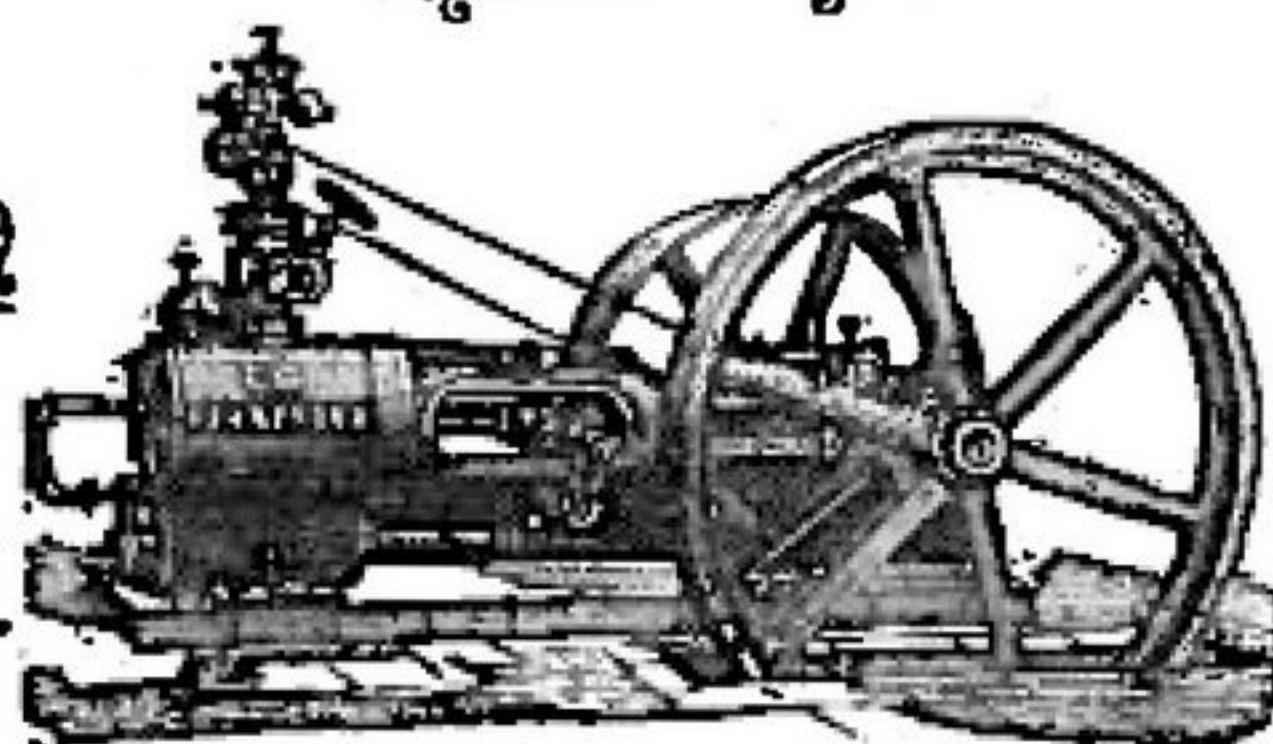
A. L. IDE, Maker, Springfield, Ill. U. S. A.

HORIZONTAL
—AND—
VERTICAL.

NEW DEPARTURE

ECONOMICAL,
EFFICIENT,
DURABLE.

We are Making and Selling
AN ENGINE A DAY.



More than 1,000 in Daily Use,
All Giving Perfect Satisfaction.

STEAM ENGINES

At Nearly 50 Per Cent. Less than Former Prices.

\$250 for 15 Horse Power to \$550 for 60 Horse Power.

Engine complete with Best Make of Governor, Governor Belt, Heater, Throttle Valve, and a Craige Sight-Feed Lubricator at prices named.

EACH ENGINE TESTED UNDER STEAM BEFORE SHIPMENT, AND GUARANTEED TO GIVE PERFECT SATISFACTION.

ALWAYS RELIABLE, SURE AND EFFICIENT.

These Engines are well adapted to *MILLING*, and are in extensive use throughout the country for that purpose. We refer to the Nordyke & Marmon Co., who adopted our Engines after most thorough trial, as first-class motors for their celebrated mills, fully assured that they met every requirement as such. All in want of Engines will please send for circulars, which give scores of voluntary testimonials and hundreds of references in favor of these Engines by persons who have them in daily use. We are proprietors of

THE HEALD AND SISCO CENTRIFUGAL PUMPS,

Of world-wide celebrity, and also manufacturers of *COMBINED ENGINE AND PUMP*. Send for circulars. In ordering circulars or pamphlets please mention *THE MILLSTONE*. Address

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THE ORIGINAL AND LARGEST MANUFACTURERS IN THE UNITED STATES OF

COTTON BELTING!

UNAFFECTED BY HEAT, COLD OR MOISTURE.

Especially adapted for Elevators, Mills, Carrying Belts, Etc.

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WEBBING, With Selvage Edges, in Various Widths,
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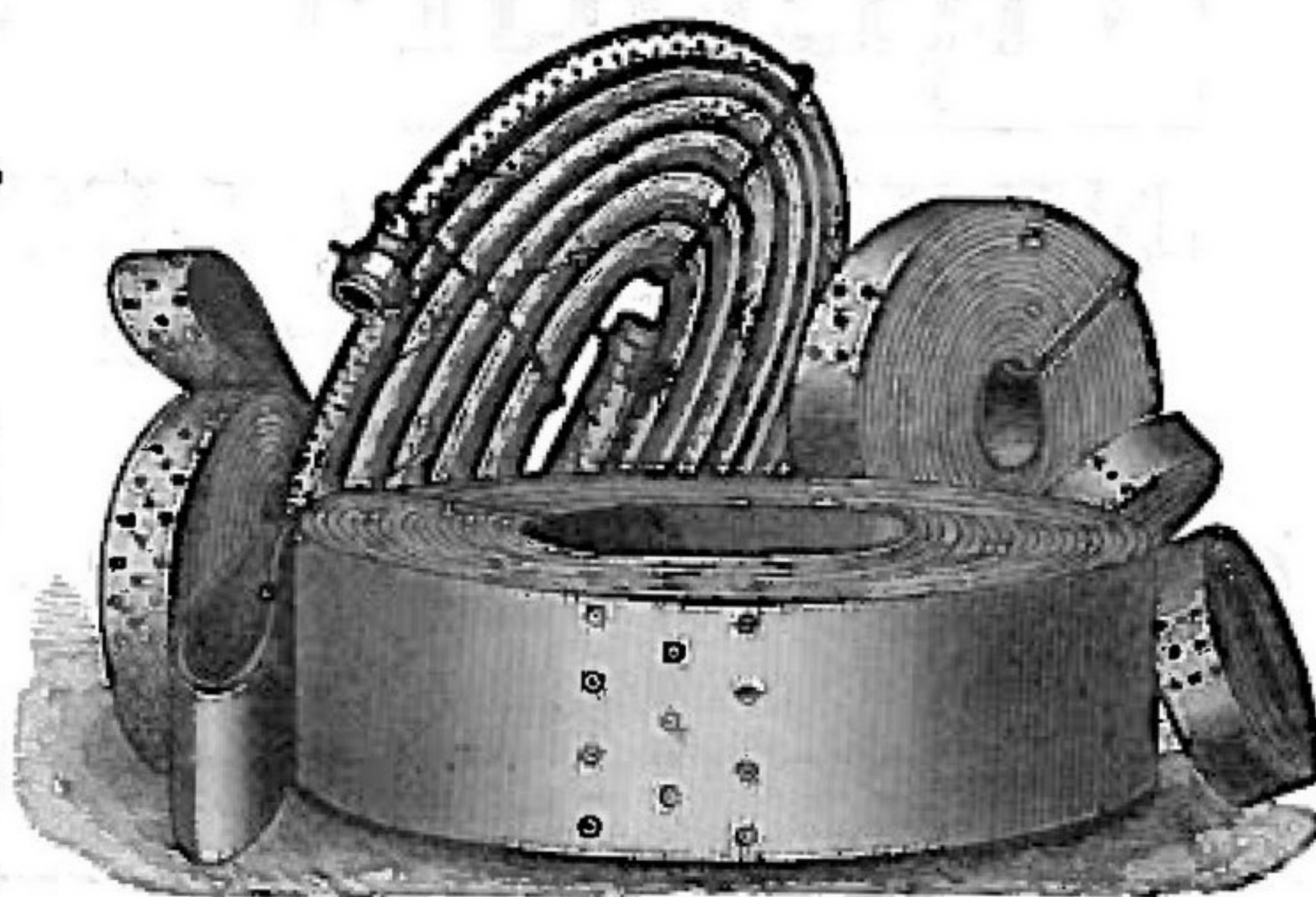
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LEATHER BELTING!

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LACE LEATHER

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LEATHER HOSE

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MILL SUPPLIES!

ALL GOODS WARRANTED

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Large Driving Belts a Specialty.

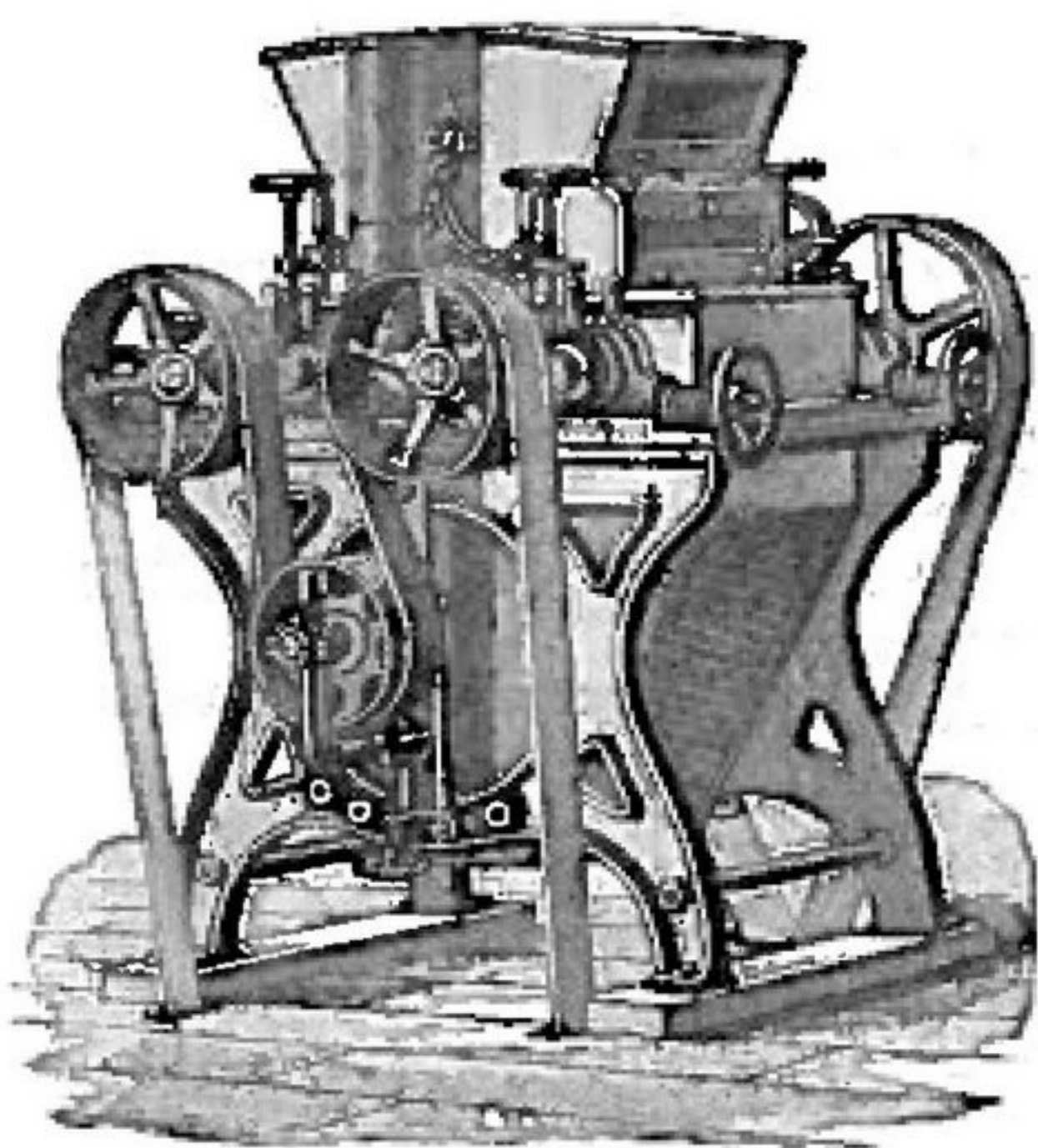
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FACTORIES,

VALLEY FALLS, R. I.



THE NEW ROLL!

The Rickerson Roller Mill!

IMPROVED! NOISELESS!

THE ONLY SIX-INCH ROLLER MILL.
POSITIVE MOTION ON EACH ROLL.

We guarantee satisfaction on each and every reduction from first break to finish. Steel Journals, Ground and Polished. Less friction. Always cool. Requiring less power, with greater capacity and better results. The only Roller Mill with Patent Attachment for Keeping Stock Cool. No sweating, no dough-balls, no waste. A Complete Success. All strongly covered by Patents.

—OWNED AND MANUFACTURED BY—

O. E. BROWN M'F'G CO., - Grand Rapids, Mich.
J. M. FINCH, Milling Engineer. Correspondence Solicited.



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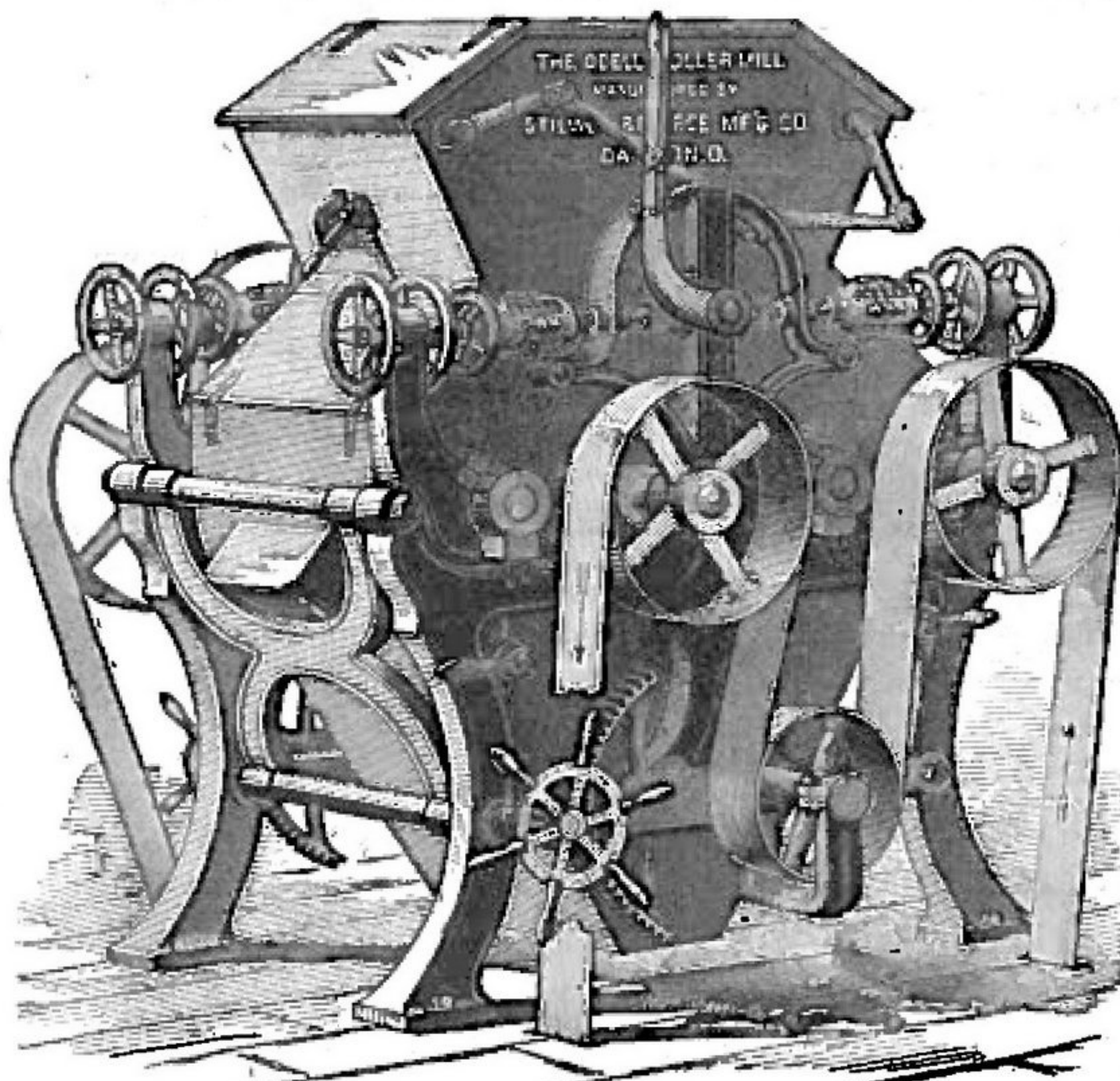
THORNBURGH & GLESSNER,

14 to 24 North Clinton Street,
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Will send to any reader of "The Millstone" a copy of their New and
Finely Illustrated Catalogue containing complete descriptive lists of their
Elevating and Conveying Machinery.
SEND FOR IT!

ODELL'S ROLLER MILL SYSTEM

Is now in Successful Operation in a large number of mills, both large and small, on hard and soft wheat, and is meeting with Unparalleled Success. All the mills now running on this system are doing very fine and close work, and we are in receipt of the most flattering letters from millers. References and letters of introduction to parties using the Odell Rolls and System, will be furnished on application to all who desire to investigate.



Odell's Roller Mill

Invented and patented by U. H. ODELL, the builder of several of the largest and best Gradual Reduction Flour Mills in the country,

An Established Success

WE INVITE PARTICULAR ATTENTION TO THE FOLLOWING

POINTS OF SUPERIORITY

Possessed by the Odell Roller Mill over all competitors, all of which are broadly covered by patents, and cannot be used on any other machine:

1. It is driven entirely with belts, which are so arranged as to be equivalent to giving each of the four rolls a separate driving-belt from the power-shaft, thus obtaining a *positive differential motion* which cannot be had with short belts.
2. It is the only Roller Mill in the market which can *instantly be stopped without throwing off the driving belt*, or that has adequate tightener devices for taking up the stretch of the driving-belts.
3. It is the only Roller Mill in which *one movement of a hand-lever spreads the rolls apart and shuts off the feed at the same time*. The reverse movement of this lever brings the rolls back again exactly into working position and at the same time turns on the feed.
4. It is the only Roller Mill in which the movable roll-bearings may be adjusted to and from the stationary roll-bearings *without disturbing the tension-spring*.
5. Our Corrugation is a decided advance over all others. It produces a more even granulation, more middlings of uniform shape and size, and cleans the bran better.

We Use none but the Best Ansonia Rolls.

Our Corrugation Differs from all others, and Produces

Less Break Flour and Middlings of Better Quality.

Mill owners adopting our Roller Mills will have the benefit of Mr. Odell's advice and long experience in arranging mills. Can furnish machines on short notice. For further information, apply in person or by letter to the Sole Manufacturers,

STILWELL & BIERCE MANUFACTURING CO., Dayton, O.

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Pres't and Gen'l Manager.
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Vice President.

{ Established,
1863.
Incorporated,
1882. }

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E. T. Barnum Wire and Iron Works,

Detroit, Mich. Chicago, Ill. Windsor, Ont.

MANUFACTURERS OF

WIRE CLOTH!

OUR RESERVOIR VASES

— ARE —
Constructed on Sci-
entific Principles.

THEY REQUIRE
WATER
ONLY ONCE IN
10 or 15
DAYS

AND ARE THUS ESPECIALLY ADAPTED FOR
Cemeteries and Parks.

ADORN YOUR LAWNS.
Make Your Home Attractive.

BEAUTIFY
Your Cemetery Lots
— WITH OUR —

**Celebrated Iron
RESERVOIR
VASES.**



OUR PATENT RESERVOIR VASES

— ARE —
PERFECT
— IN —
Every Way.

The peculiar feature in these vases consists in the reservoir for water. They need watering only once in ten or fifteen days, according to the size of the vase, the water being drawn upward by capillary attraction (as in nature). The ground does not become caked and hard as in the ordinary vases, but remains open and porous through the entire season. There is no excess of moisture, and plants thrive in them to perfection.

In ordinary vases the earth becomes hard and baked and plants wither and die, vases for flowers are then declared a failure and are thrown aside or sold for old iron. Our patent reservoir vases overcome all this difficulty and plants thrive and bloom in them to their fullest development.

All the conditions for growing hardy and vigorous plants are supplied by our reservoir vases, and they are the only vases that do afford these essential requirements.

The peculiar feature of the vases is that the moisture is drawn upward from the reservoir to the plants by capillary attraction (as in nature). There is, therefore, no lack of moisture, no excess of moisture, and plants thus thrive to perfection.

Especially adapted for cemeteries and parks, as they only require water once in ten or fifteen days, according to size.

The earth in these vases never bakes or becomes hard and dry. It is always moist and porous and in proper condition to make plants thrive the best; an occasional filling is all that is required.

Our vases are painted in any color or colors, or variety of colors, or bronzed as may be desired.

WE MANUFACTURE

Wire and Iron Work of Every Description.

Send for our large Vase Catalogue. Address all correspondence to

E. T. BARNUM WIRE & IRON WORKS, WORKS AND General Offices **DETROIT, MICH., U.S. A.**

OVER ALL COMPETITORS!

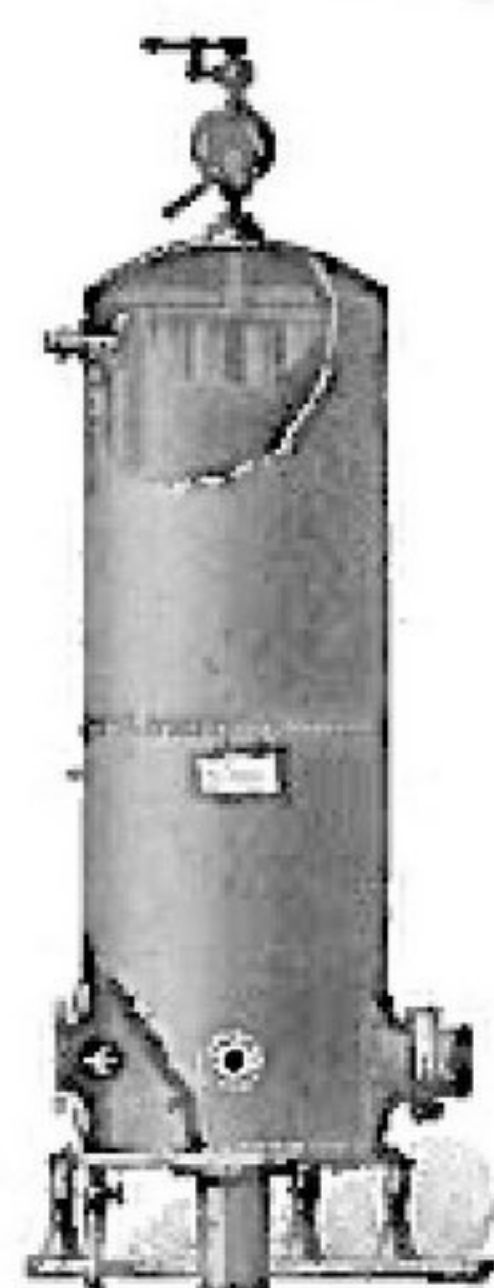
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WAS AWARDED FIRST PREMIUM
At the First Millers' International Exhibition.
PURCHASE ONLY FROM RELIABLE DEALERS.

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STEAM JACKET

Feed Water Heater

—AND—
PURIFIER.

Delivers Feed Water several Degrees above
 Boiling Point, and Reduces Back
 Pressure on the Engine.



It Removes Scale and In-
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 Boilers,

SAVES FUEL,
*Increases the Steam-
 ing Capacity of*
 Boilers,

AND SAVES
BOILER REPAIRS.

WM. BARAGWANATH,
PACIFIC BOILER WORKS,
Quincy Street, near Desplaines,
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Practical Arithmetic made EASY, SIMPLE and CON-
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 work, besides thousands of other practical problems
 which come up every day in the year. Will prove of
 GREAT BENEFIT, almost a necessity, in the hands of
 every Farmer, Mechanic and Tradesman.

It is neatly printed, elegantly bound, accompanied
 by a RENEWABLE Diary, SILICATE Slate, PERPETUAL
 Calendar, and VALUABLE Pocket-book, all combined
 for the price of a COMMON diary.

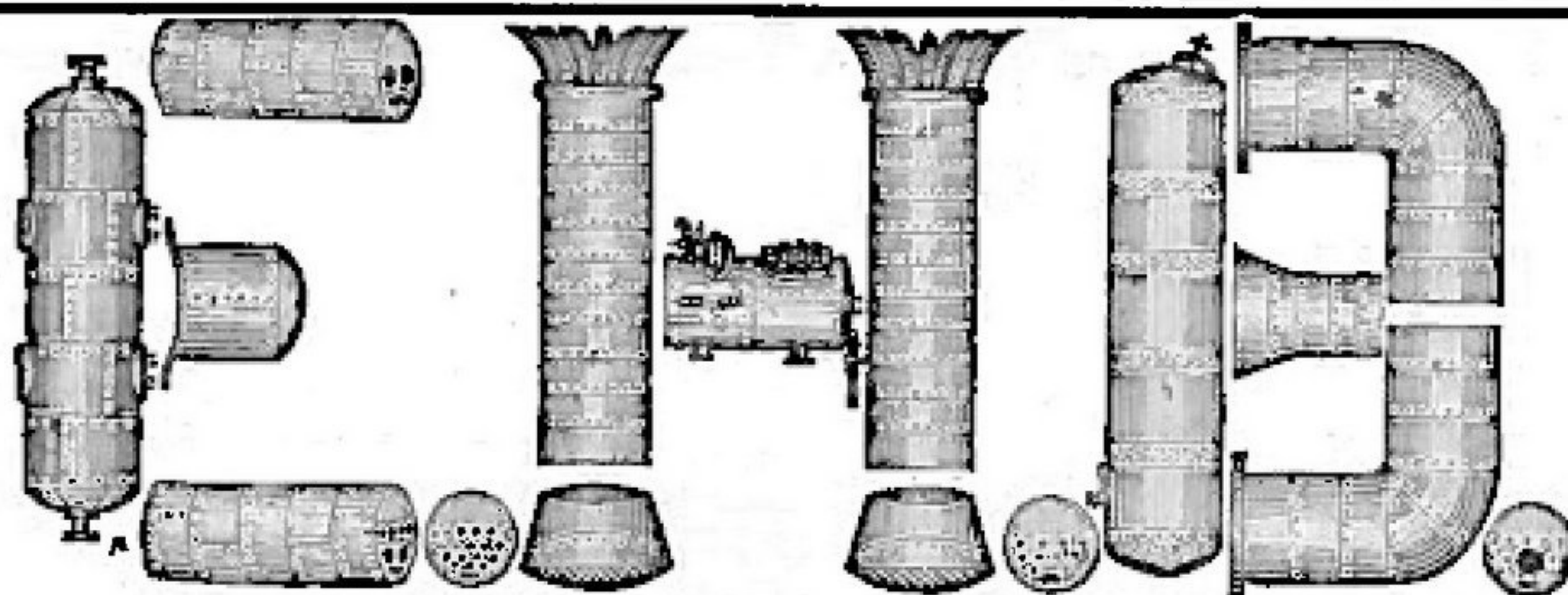
Fine English Cloth, - 75c.; Morocco Leather, - \$1.00
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 Sent postpaid to any address on receipt of price.

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Indianapolis, Ind.

Books for Builders,

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TRADE MARK.



Established 1855

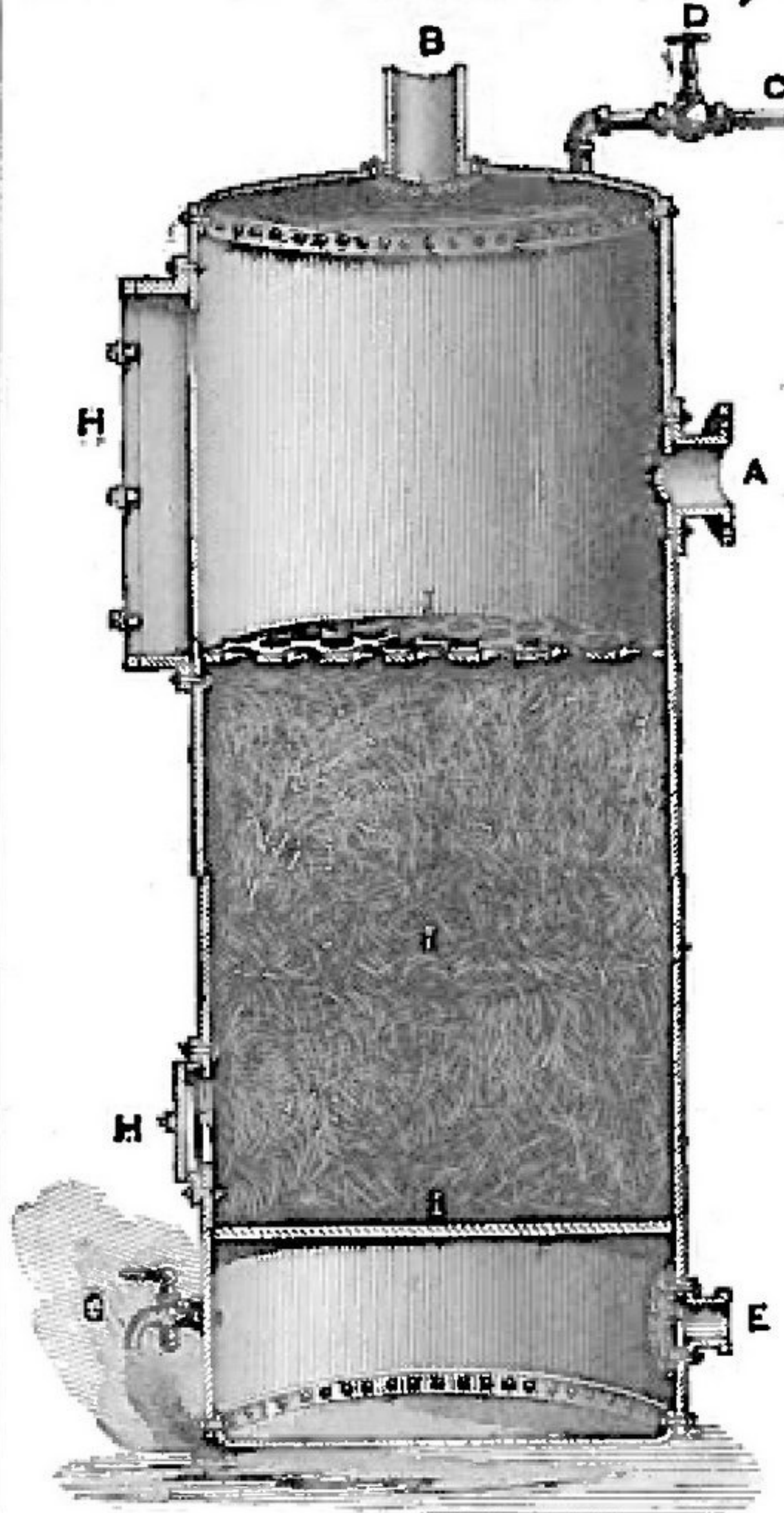
E. H. BROWNELL & CO.,
 —MANUFACTURERS OF—

STEAM BOILERS

And Heavy Sheet Iron Work.

THIS CUT REPRESENTS THE E. H. BROWNELL

Exhaust Steam Heater, Filter and Lime Extractor.



This Heater has been before the pub-
 lic since 1855, and has always given as
 good satisfaction as other Exhaust
 Heaters costing twice, and even four
 times the price asked for this.

It is amusing to hear parties, when
 speaking of their heater, say: "Our
 heater puts water into the boiler 20 to
 30 degrees hotter than that other
 man's heater," and it becomes ridicu-
 lous when it is known that steam at a
 certain pressure has a certain temp-
 erature. To be sure a trifle in heating
 is gained in some exhaust steam heat-
 ers, by making the outlet from the
 heater much smaller than allowable,
 but any such gain is at the expense of
 the power of the engine in overcoming
 the back pressure thus brought about.

The claims for this heater are:

- 1—Its neat appearance.
- 2—Its durability.
- 3—Simplicity.
- 4—Easily cleaned.

5—That if our customers will put a
 few lime stones, of say 4 inch size, on
 top of top plate, the water passing
 through the pile of stones, which are
 highly heated, will insure better re-
 sults than can be obtained from any
 other heater.

E. H. BROWNELL & CO.,
 403, 405 and 407 East First-st., DAYTON, O.

WILLIAM E. CATLIN & CO.,

48 SOUTH CANAL-ST., CHICAGO, ILL.

MANUFACTURERS AGENTS FOR

✦SOLID✦WOVE✦COTTON✦BELTING✦

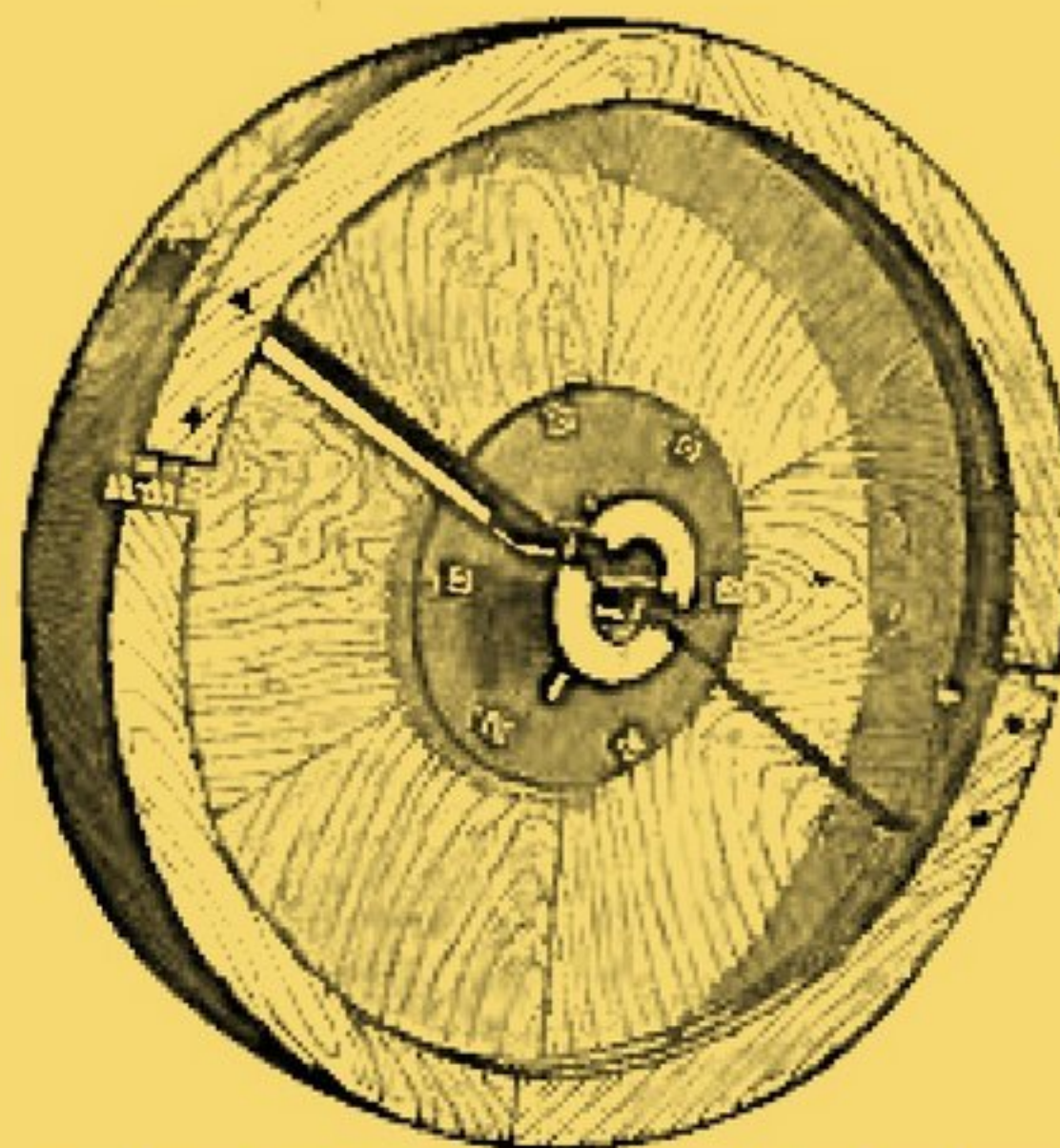
PRICE LIST OF BELTING PER RUNNING FOOT.

Width in Inches...	1	1¼	1½	1¾	2	2¼	2½	3	3¼	4	4½	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Leather.....	.09	.12	.15	.18	.21	.27	.33	.39	.45	.51	.57	.69	.81	.93	1.05	1.17	1.29	1.41	1.53	1.65	1.80	1.94	2.10	2.26	2.42	2.58	2.74	2.90	3.06	3.22	
Rubber, 3-ply.....	.10½	.12	.13	.15	.17	.22	.26	.30	.34	.39	.43	.52	.60	.70	.80	.90	1.00	1.08	1.18	1.28	1.38	1.50	1.70	1.90	2.10	2.30	2.50	2.70	2.90	3.10	
" 4-ply.....				.21	.26	.31	.37	.42	.47	.52	.62	.73	.84	.95	1.07	1.18	1.30	1.42	1.54	1.66	1.78	2.02	2.26	2.50	2.74	2.98	3.22	3.46	3.70	3.94	
Cotton, 2-ply.....	.04	.05	.06	.07	.08	.09	.10	.11	.12	.13	.14	.15	.16	.17	.18	.19	.20	.21	.22	.23	.24	.25	.26	.27	.28	.29	.30	.31	.32	.33	.34
" 3-ply.....				.11	.13	.15	.16	.18	.20	.22	.24	.26	.28	.30	.32	.34	.36	.40	.42	.44	.46	.48	.50	.52	.54	.56	.58	.60	.62	.64	.66
" 4-ply.....					.21	.24	.26	.28	.30	.32	.34	.36	.38	.40	.42	.44	.46	.50	.52	.54	.56	.58	.60	.62	.64	.66	.68	.70	.72	.74	.76

Write for discounts from above prices.

Wood

Saves from 25 to 50 per cent.
of Power over any Metal
Pulley.



Pulleys

Saves from 25 to 50 per cent.
of Power over any Metal
Pulley.



PRICE LIST.

Diameter in Inches.	Face, 3 Inches.	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24
6	\$2 15	\$2 35	\$2 55	\$2 80	\$3 00	\$3 25	\$3 50	\$3 75	\$4 00	\$4 25	\$4 50	.....	.....	.....	.....	.....	.....	.....
7	2 25	2 50	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 50	4 75	.....	.....	.....	.....	.....	.....	.....
8	2 50	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 50	4 75	5 00	.....	.....	.....	.....	.....	.....	.....
9	2 55	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 50	5 50	5 25	.....	.....	.....	.....	.....	.....	.....
10	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 50	5 50	5 75	6 00	\$6 25	.....	.....	.....	.....	.....	.....
11	2 85	3 10	3 30	3 60	3 90	4 25	4 50	5 00	5 25	5 75	6 00	6 50	.....	.....	.....	.....	.....	.....
12	3 00	3 25	3 55	4 00	4 25	4 60	5 00	5 50	5 80	6 25	6 50	7 00	.....	.....	.....	.....	.....	.....
13	3 25	3 50	3 75	4 10	4 50	5 00	5 30	5 75	6 25	6 75	7 25	7 75	.....	.....	.....	.....	.....	.....
14	3 35	3 65	4 00	4 25	4 75	5 25	5 75	6 25	6 75	7 25	7 75	8 50	.....	.....	.....	.....	.....	.....
15	3 45	3 85	4 20	4 55	5 00	5 65	6 10	6 75	7 25	7 75	8 25	8 75	.....	.....	.....	.....	.....	.....
16	3 75	4 10	4 40	4 85	5 45	6 00	6 50	7 25	7 75	8 25	8 75	9 25	\$9 75	.....	.....	.....	.....	.....
17	3 90	4 30	4 75	5 20	5 75	6 35	6 85	7 80	8 00	8 50	9 00	9 75	10 50	.....	.....	.....	.....	.....
18	4 00	4 45	4 85	5 50	6 00	6 65	7 25	7 90	8 50	9 20	9 75	10 25	10 75	.....	.....	.....	.....	.....
19	4 30	5 00	5 40	6 25	6 75	7 25	7 75	8 50	9 00	9 75	10 25	10 75	11 50	.....	.....	.....	.....	.....
20	4 50	5 25	5 75	6 50	7 00	7 50	8 00	8 75	9 25	10 00	10 75	11 50	12 25	.....	.....	.....	.....	.....
21	4 75	5 50	6 00	6 85	7 50	8 25	9 00	9 75	10 50	11 25	12 00	12 75	13 75	.....	.....	.....	.....	.....
22	5 00	5 75	6 25	7 00	7 75	8 50	9 50	10 50	11 25	12 00	12 75	13 50	14 50	.....	.....	.....	.....	.....
23	5 25	5 85	6 50	7 25	8 00	9 00	9 75	10 50	11 50	12 25	13 00	13 75	14 75	.....	.....	.....	.....	.....
24	5 50	6 00	6 75	7 50	8 50	9 50	10 25	11 00	11 75	12 50	13 25	13 25	15 25	\$16 25	.....	.....	.....	.....
25	6 00	6 50	7 00	7 75	8 75	9 75	11 00	11 75	12 50	13 25	14 00	15 00	16 00	17 00	.....	.....	.....	.....
26	6 50	7 00	7 50	8 25	9 00	10 00	11 50	12 50	13 25	14 25	15 00	15 75	16 50	17 50	.....	.....	.....	.....
27	7 00	7 50	8 00	9 00	10 00	11 00	12 00	13 50	14 25	15 00	15 75	16 50	17 50	18 50	.....	.....	.....	.....
28	7 50	8 00	8 50	9 50	11 50	11 50	12 50	14 25	15 25	16 25	17 00	18 00	19 00	20 00	.....	.....	.....	.....
29	8 50	9 00	9 75	11 00	11 75	12 75	13 75	14 75	15 75	16 75	17 75	18 00	20 00	21 00	.....	.....	.....	.....
30	9 00	9 50	10 50	11 50	12 50	13 50	14 50	15 50	16 50	17 50	18 75	20 00	22 00	23 50	.....	.....	.....	.....
31	.....	10 00	11 00	12 00	13 00	14 00	15 00	16 00	17 00	18 00	19 50	21 00	23 00	24 50	.....	.....	.....	.....
32	.....	10 50	11 25	12 25	13 25	14 50	15 50	16 50	17 50	18 50	20 25	22 00	23 50	25 00	.....	.....	.....	.....
33	.....	11 00	11 75	12 75	13 75	15 00	16 25	17 50	18 50	19 50	21 50	23 25	25 50	27 00	.....	.....	.....	.....
34	.....	11 25	12 00	13 00	14 25	15 50	16 75	18 00	19 25	20 50	22 50	24 25	26 50	28 50	.....	.....	.....	.....
35	.....	11 75	12 50	13 50	14 75	16 00	17 25	18 50	20 00	21 50	23 50	25 00	27 50	29 50	.....	.....	.....	.....
36	.....	12 00	12 75	13 75	15 00	16 25	17 50	19 00	20 50	22 00	24 00	25 75	28 00	30 25	\$35 25	\$40 75	.....	.....
38	.....	13 00	14 50	15 50	17 00	18 25	20 00	21 50	23 00	24 75	27 00	29 25	31 50	33 50	37 50	42 00	.....	.....
40	.....	.....	.....	17 00	18 00	19 25	21 00	22 50	25 25	27 00	29 25	31 75	33 50	35 25	39 50	43 50	\$48 00	\$54 00
42	.....	.....	.....	18 00	19 50	21 00	22 75	24 50	26 50	28 75	31 25	33 50	36 50	39 50	44 00	48 50	54 50	60 00
44	.....	.....	.....	19 00	21 00	22 25	24 50	26 50	28 75	31 00	33 75	35 75	38 25	40 75	45 75	51 00	57 00	63 00
46	.....	.....	.....	20 00	21 75	23 25	25 75	28 00	30 50	33 25	36 25	39 00	42 25	45 25	50 00	55 00	63 00	70 00
48	.....	.....	.....	21 00	23 00	24 75	27 50	30 00	33 00	35 75	38 50	42 00	44 00	46 75	53 25	60 00	70 00	80 00
50	.....	.....	.....	23 00	25 00	27 00	29 50	32 50	35 25	38 00	41 75	45 00	48 50	52 00	58 50	65 00	75 00	85 00
52	.....	.....	.....	25 00	28 00	30 50	33 00	35 50	37 50	40 00	43 50	47 00	51 00	54 00	62 00	71 50	80 00	90 00
54	.....	.....	.....	27 00	31 00	34 00	36 00	38 00	41 00	43 00	46 50	51 50	54 50	57 50	68 00	77 50	86 50	95 00
56	.....	.....	.....	29 00	33 00	36 50	38 50	40 00	43 00	46 00	50 00	54 00	57 50	61 00	70 00	80 00	90 00	100 00
58	.....	.....	.....	31 00	35 00	38 50	40 50	42 50	46 50	50 00	54 00	58 00	62 00	66 00	75 00	85 00	95 00	106 00
60	33 00	36 50	40 00	43 00	46 00	50 00	54 00	58 00	63 00	68 00	72 00	80 00	90 00	102 00	112 00

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Full Line of Grain Cleaners, Reducers, Scalpers, Rolls, Purifiers, Bolting Chests, Aspirators, Centrifugals and General Mill Furnishings.

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OUR BEST FRIENDS
ARE OUR CUSTOMERS!

SEE WHAT THEY SAY.

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CASE MFG. CO., Columbus, O.

Gentlemen: I am well pleased with the Rolls and Purifier, and in fact all the machines I bought of you, of your own construction. I cannot see how your "automatic feed" can be improved. I am running my mill every day, and have demonstrated that by using equivalent wheat and care, no mill within my knowledge can produce better flour or make better separations than myself. We have been running but about two months, and are now pressed hard to fill our orders for flour, notwithstanding we are close neighbors to the celebrated Toledo mills, and are selling our flour from 30 cents to 50 cents per barrel higher than most of our competing Roller Mills of other systems. Very truly yours,

JAMES H. BIDDLE.

DETROIT, Mich., May 10, 1884.

CASE MANUFACTURING CO.

Gentlemen: I inclose a draft on New York in payment of balance due you on contract; and in reply to your inquiry as to how our Roller Mill is doing, I am happy to say that the whole equipment is working splendidly, and to our entire satisfaction.

Our granulations are simply perfection, and we regard your feed on Rolls and Purifiers as the *ne plus ultra*. Our location is central in the city of Detroit, and you may, with the utmost confidence, invite parties interested to call and see what we are doing. Our flour is second to none in the city or state, and our clean-up is equal to any in the state.

Yours truly,

JOHN GLEE.

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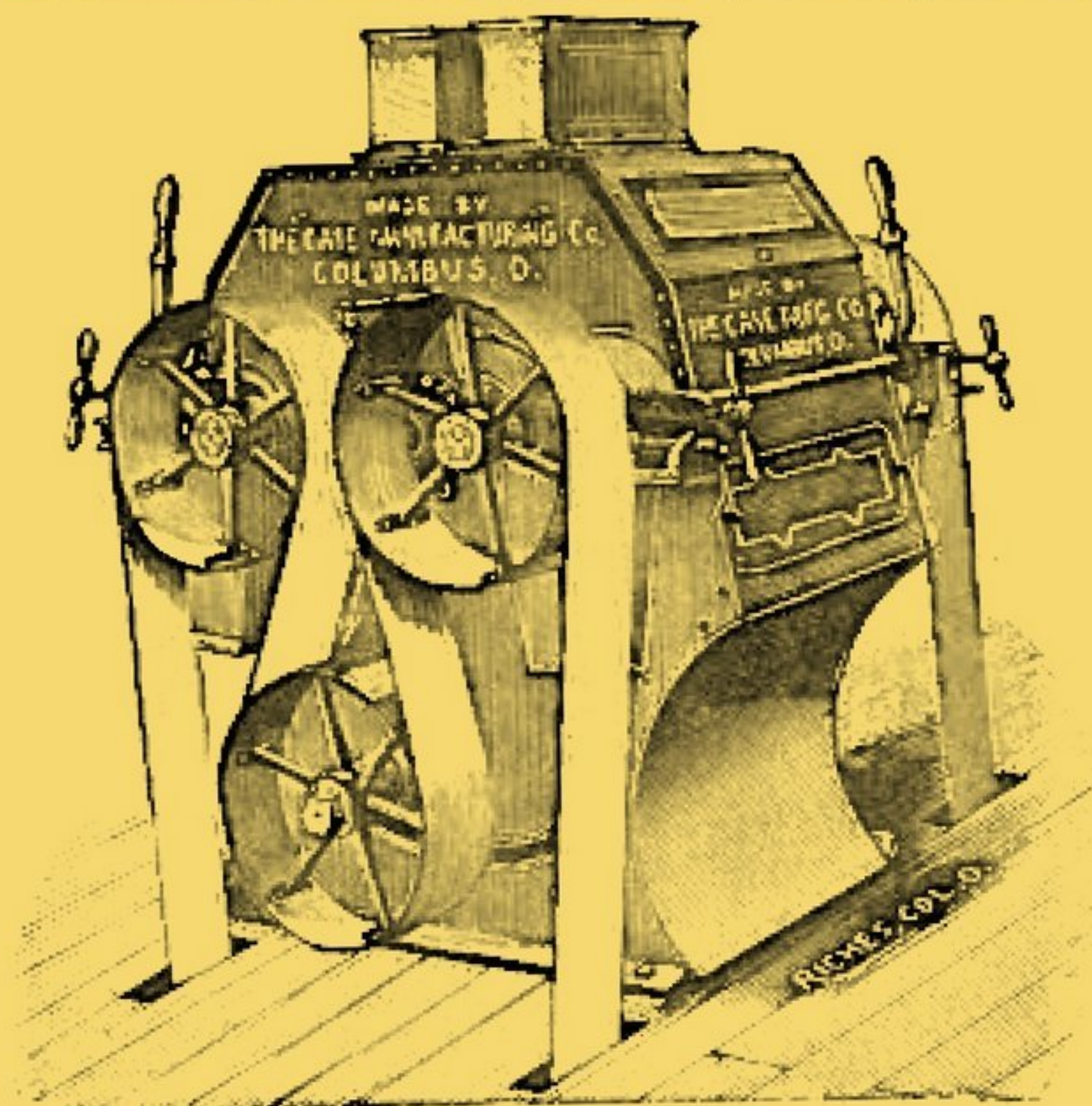
CASE MFG. CO., Columbus, O.

Gentlemen: There has been considerable inquiry of me as to how the Case Machines wear, from millers who are not acquainted with them. My reply to them has been about as follows: I have run my machines over two years, and more than half that time day and night, and I cannot see any difference in their work from when they started. The wear is not perceptible yet.

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Yours truly,

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"BISMARCK," THE ROLL.

We can show hundreds of such letters, and we can do as well by you as we did by them. Our machinery is well and strongly made, none better; and we never miss it in programming a mill.

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WOLF AND HAMAKER'S MIDDLINGS PURIFIER

The Only Machine with Two Sieves for Fine and Coarse Middlings.
LICENSED UNDER ALL CONFLICTING PATENTS.

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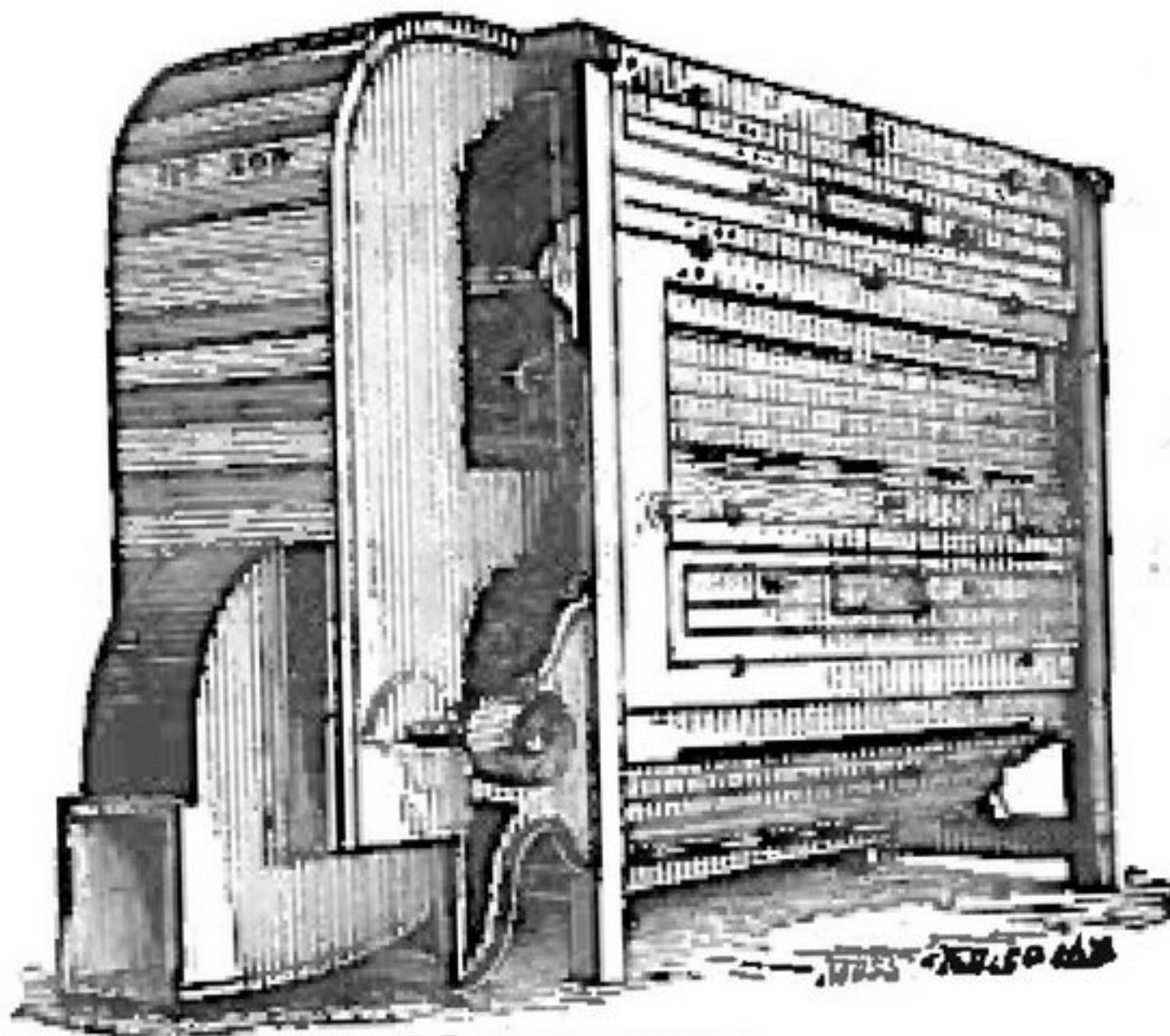
—AND—

SILVER MEDAL

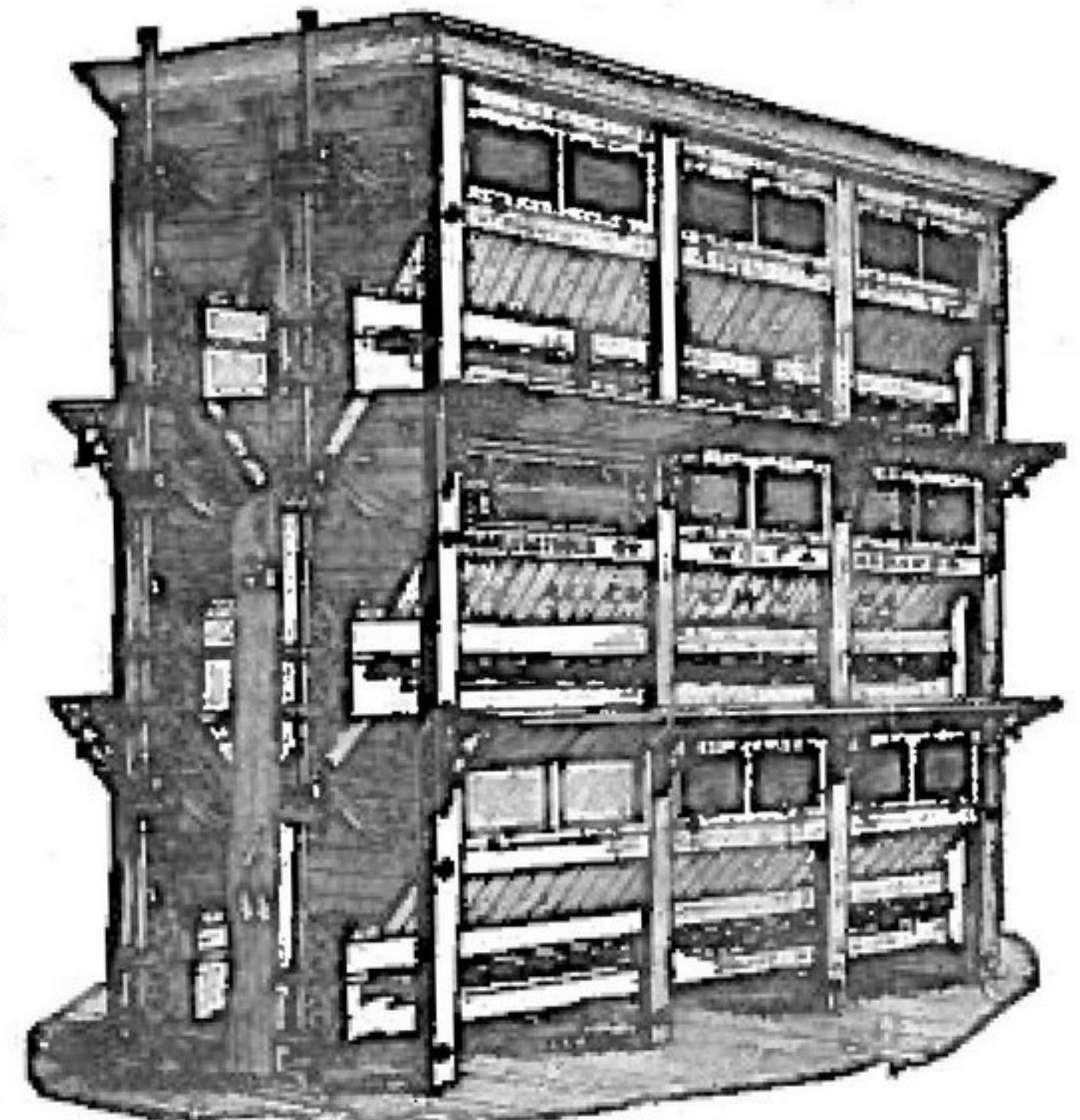
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In Competition with Seven Leading Purifiers.

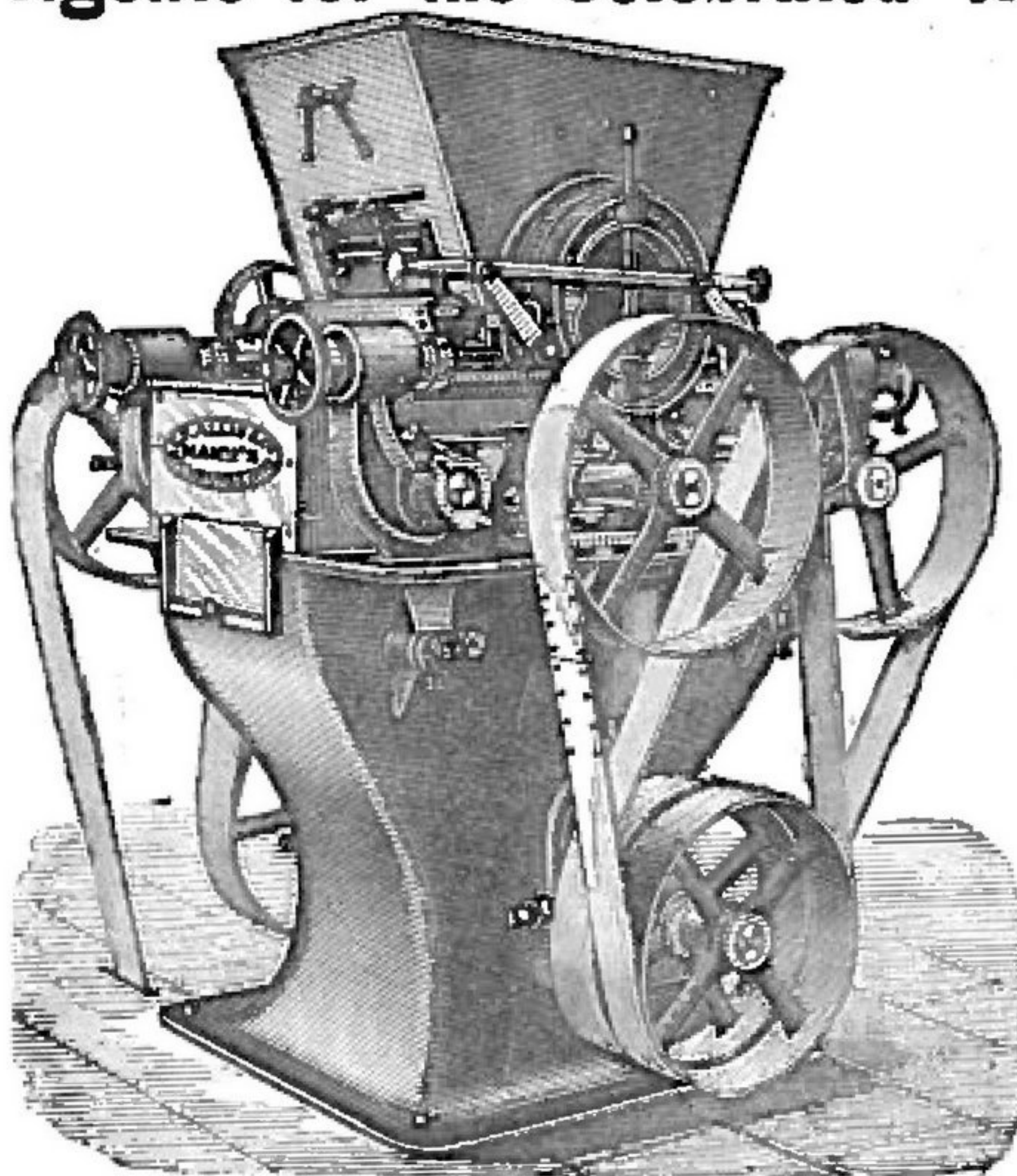


PURIFIER.

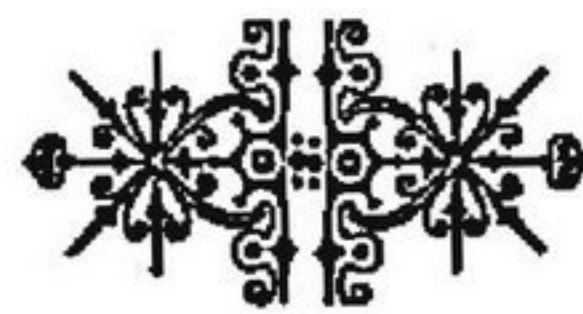


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Agents for the Celebrated Allis-Gray Patented Noiseless Roller Mill.



ALLIS ROLLER MILL—Differential Side.



Having built mills from
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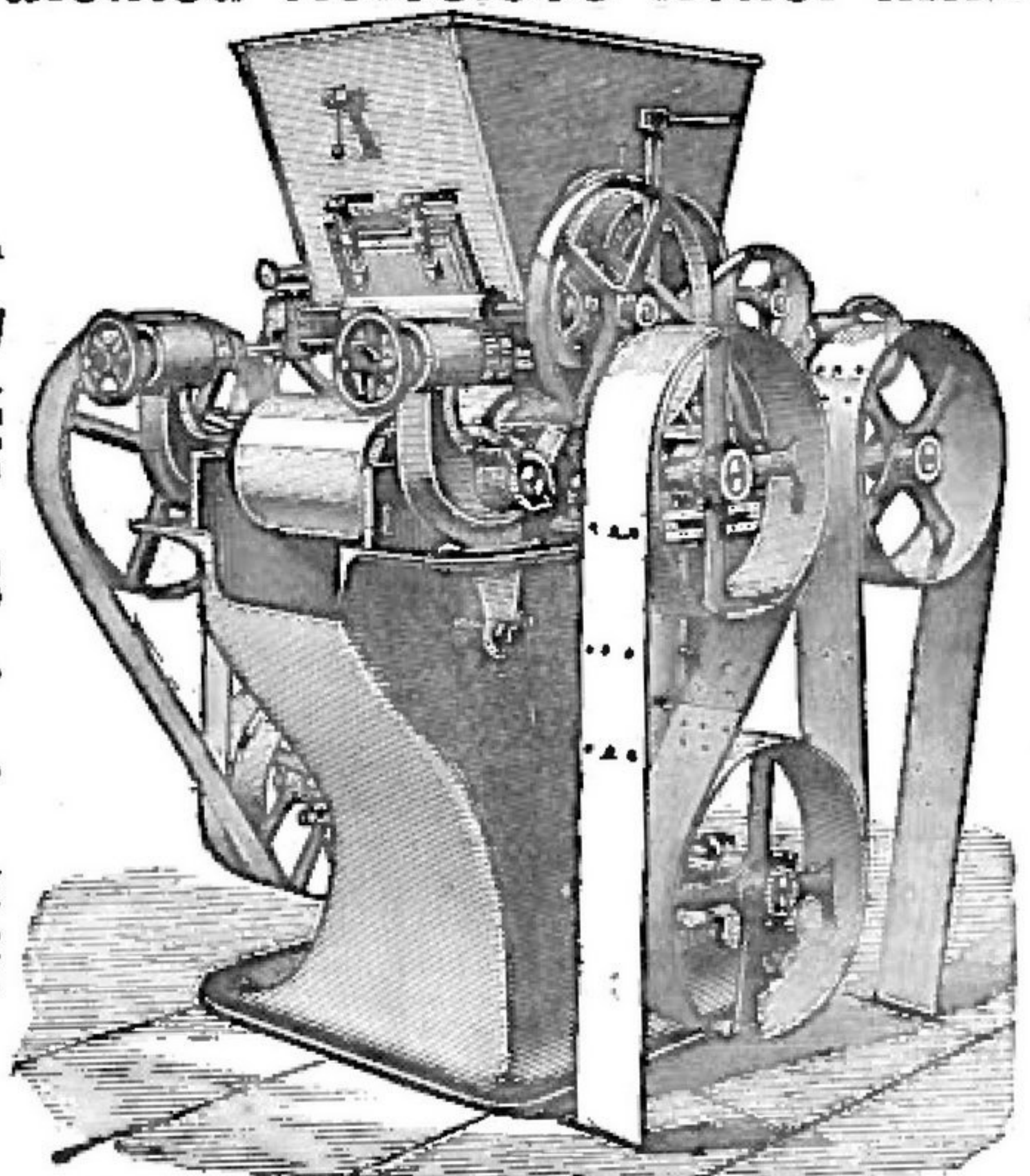
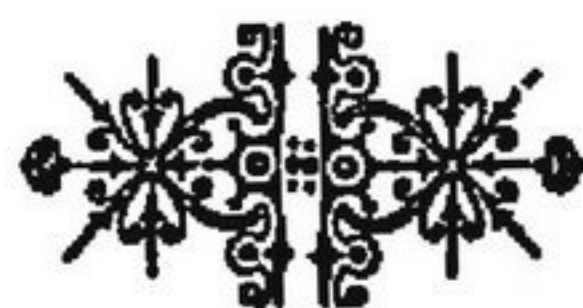
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First Class Mills

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Wolf & Hamaker's latest improved Bolting Chest, the best Bolting Chest made. Also, Mill Furnishings of every description.

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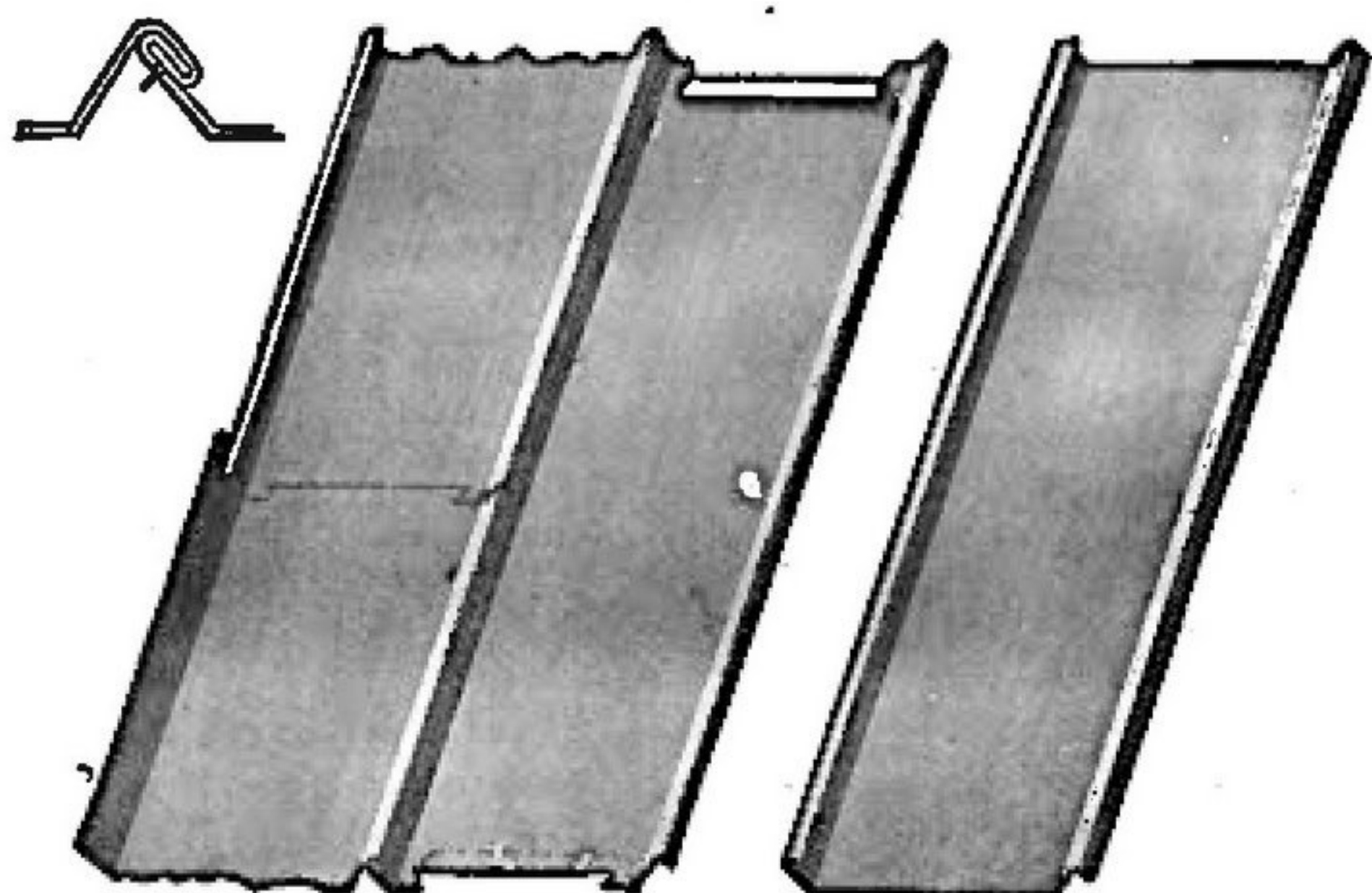
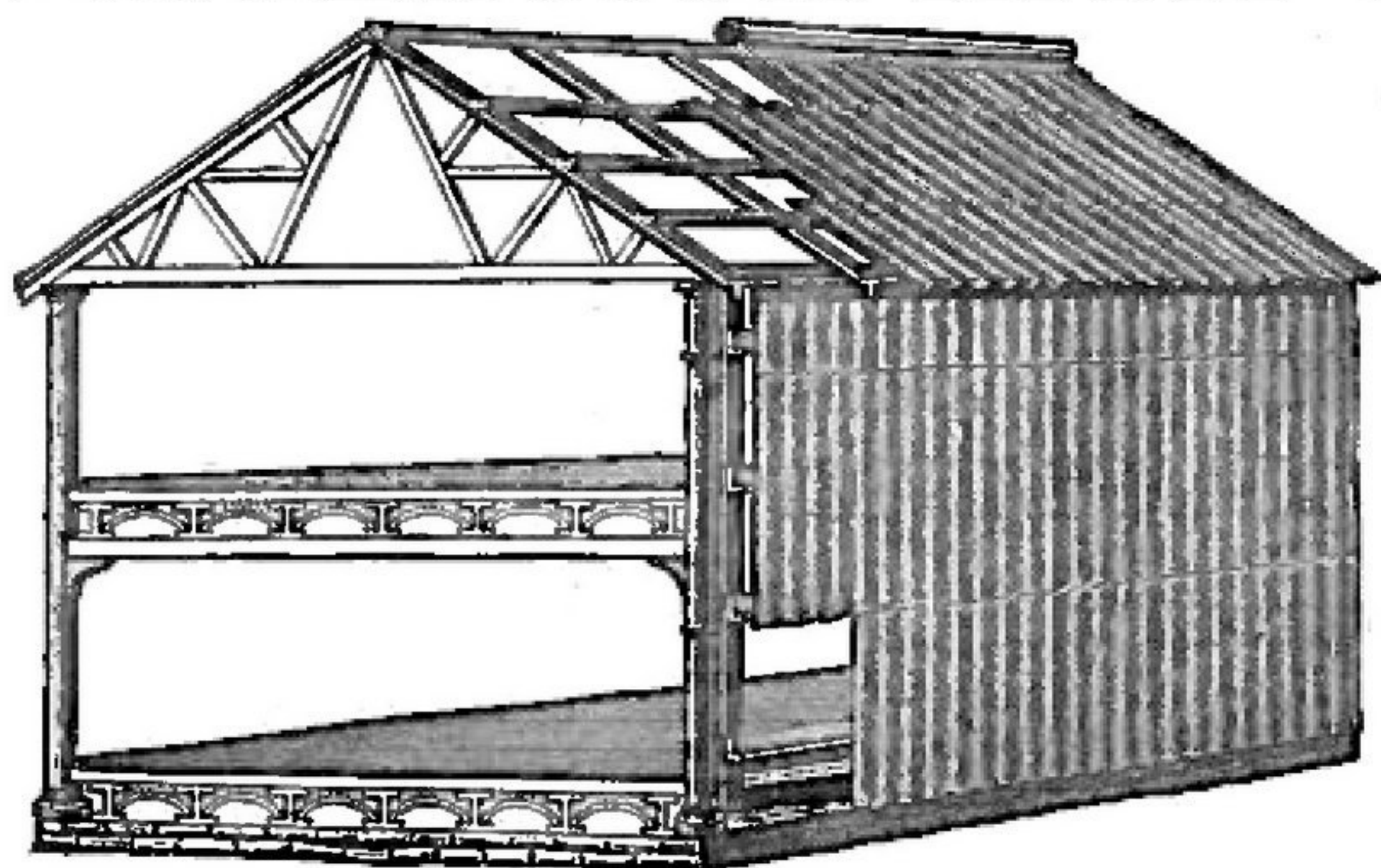
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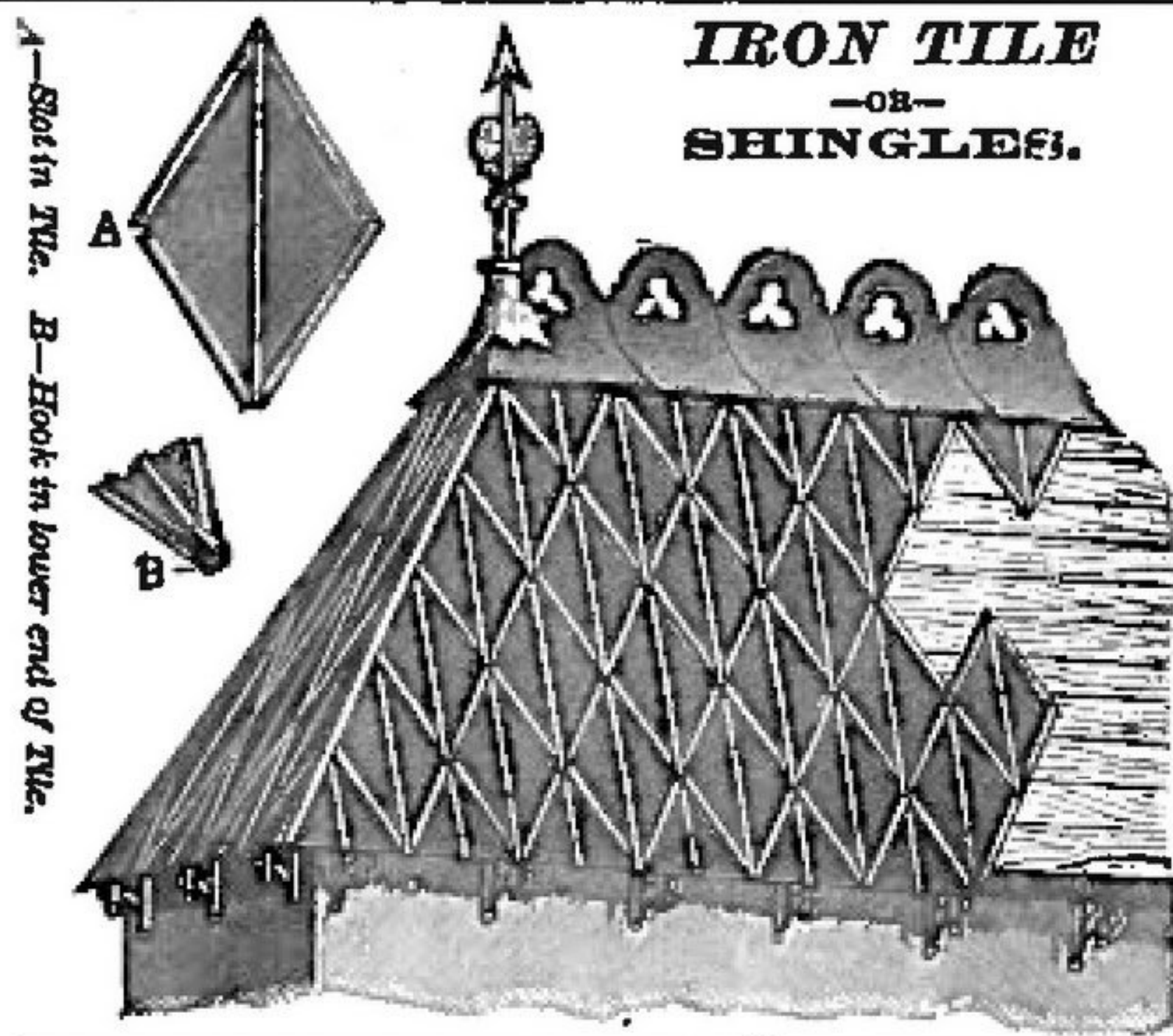
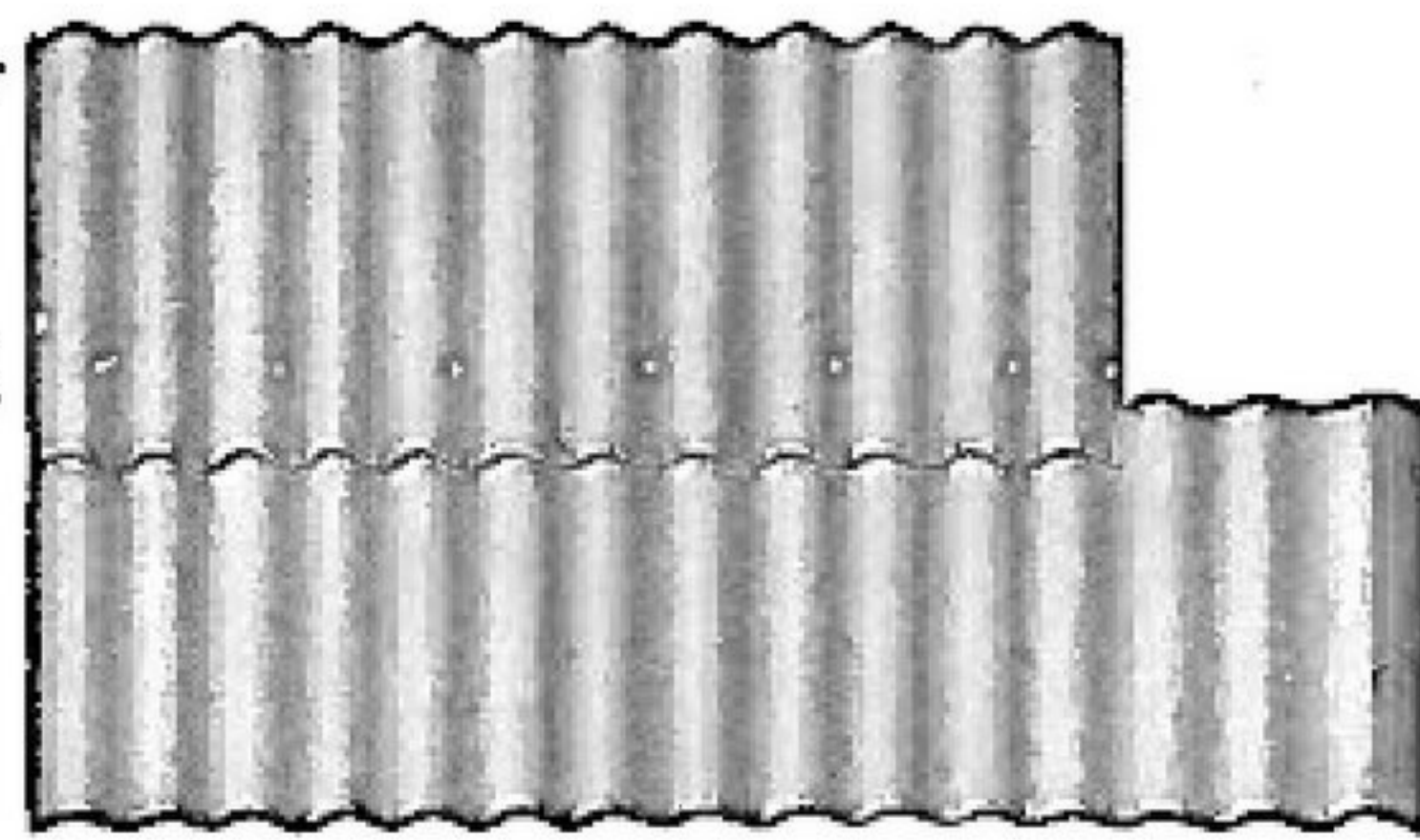
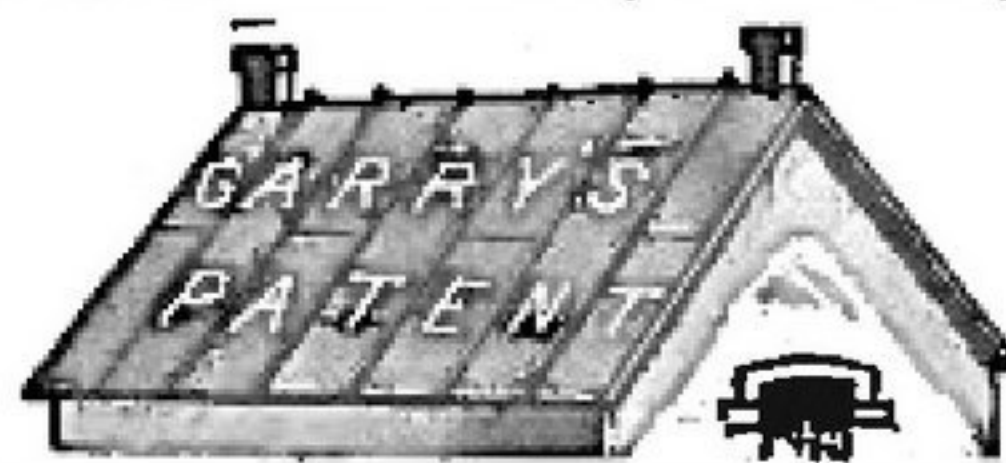
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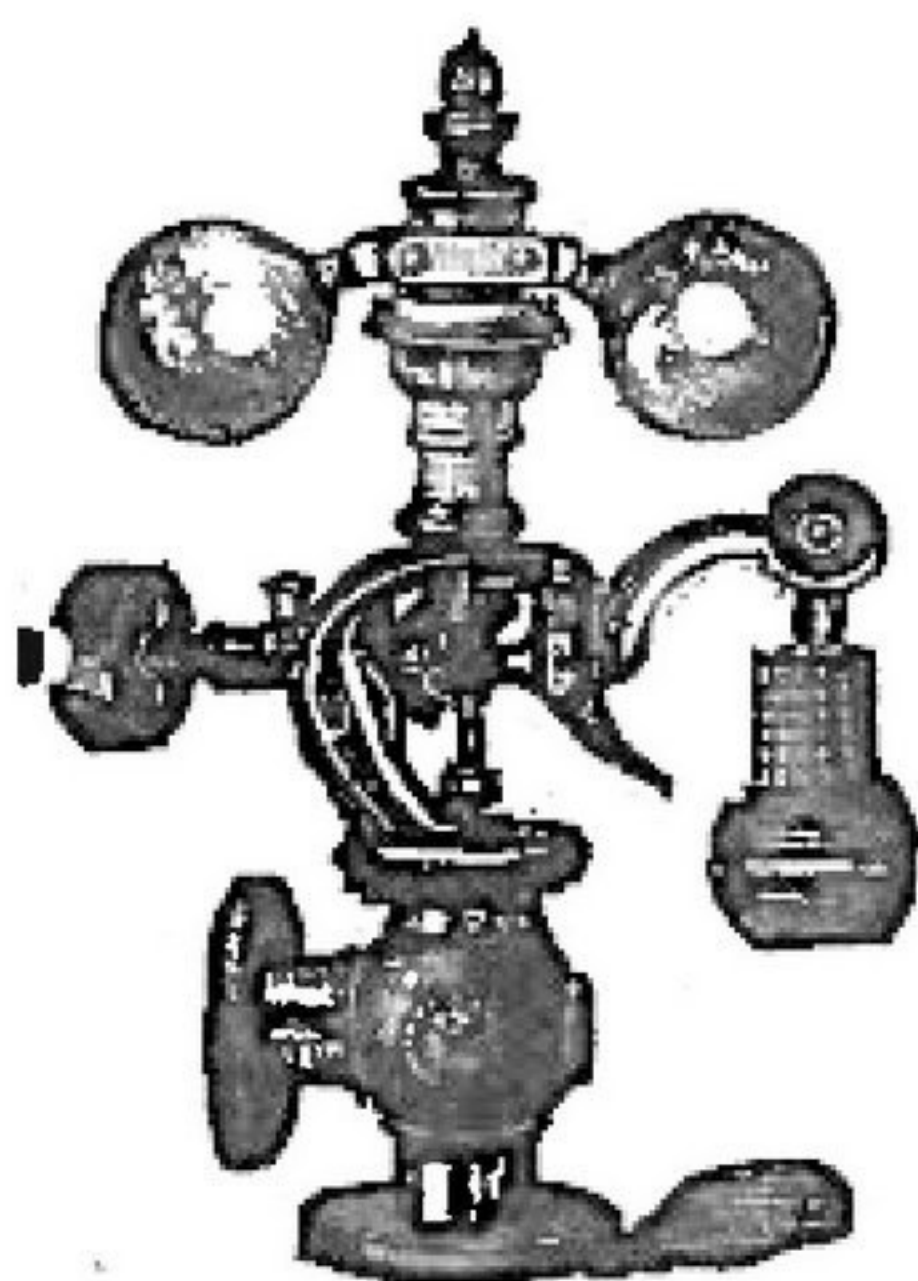
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\$60. 5-TON

Iron Lovers, Steel Bearings, Brass TARE BEAM.
JONES, HE PAYS THE FREIGHT.
Sold on trial. Warrants 5 years. All sizes as low.
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JONES OF BINGHAMTON,
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EQUILIBRIUM Driving Pulley.
Prevents Side Pull on Mill Spindles.
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"Millstone," one year, One Dollar.



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PERFECTED FOR STEAM ENGINES.

Warranted to regulate any style or size of engine accurately, at a uniform speed under all circumstances.

Positive Automatic Safety Stop and Speeder.

The most perfect, simplest and cheapest Governor in use.

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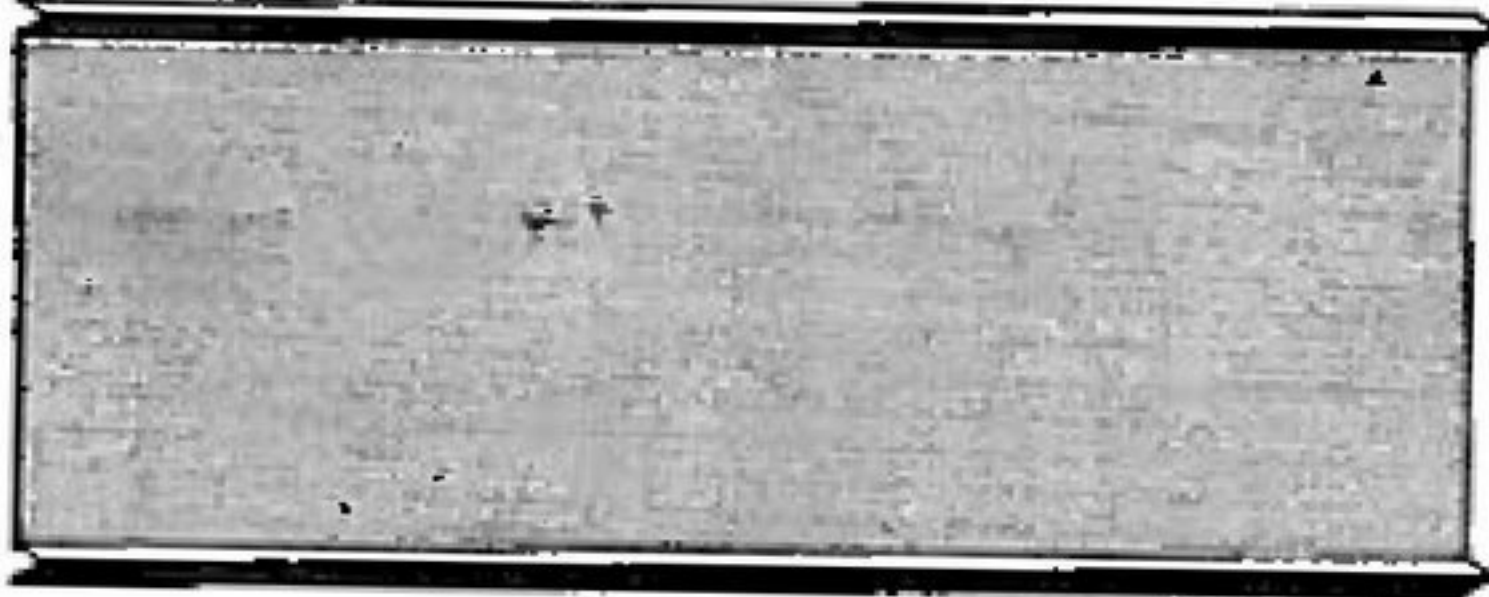
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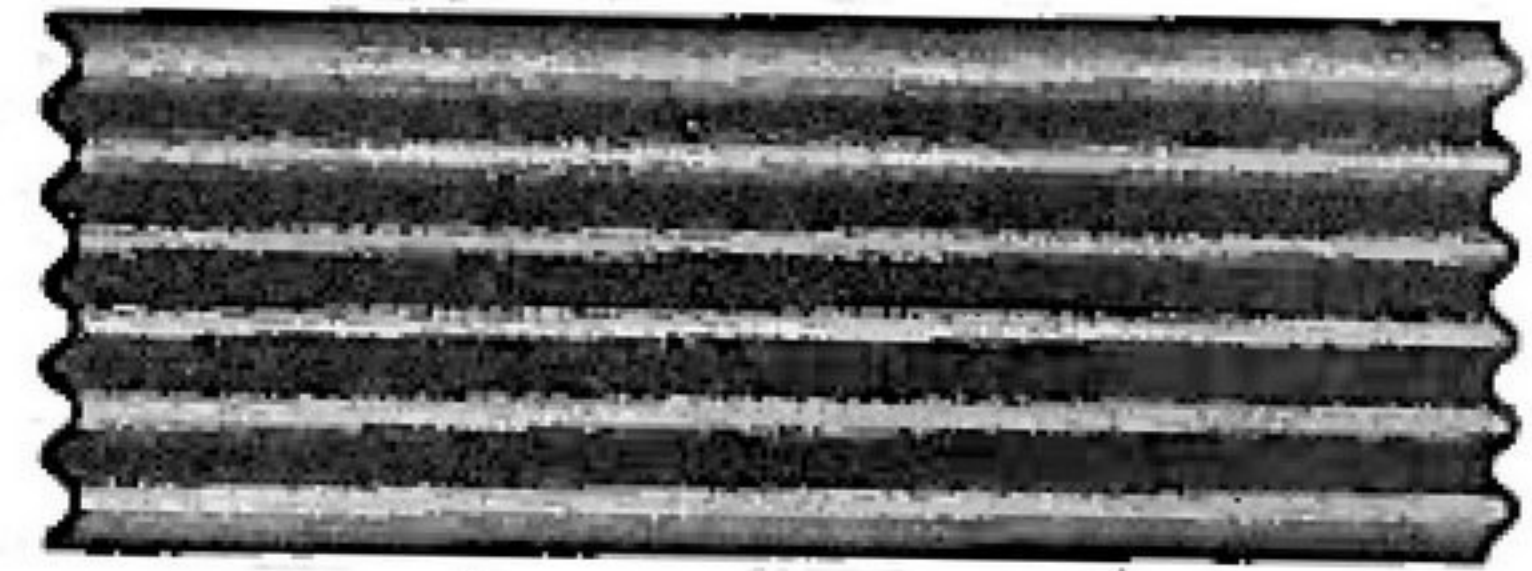
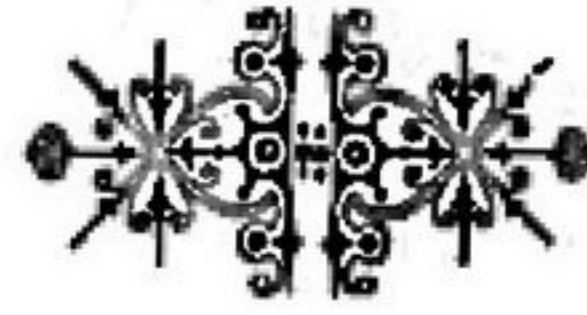
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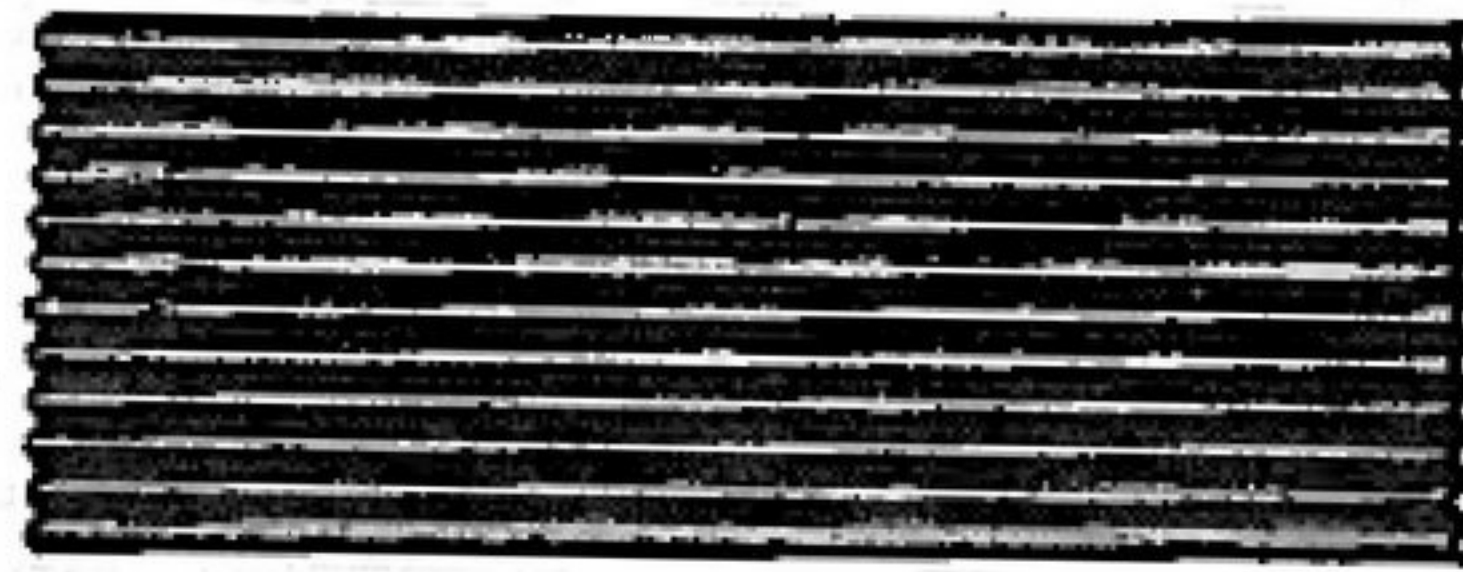
STANDARD METAL ROOFING OF THE UNITED STATES.



Representing a Sheet of our Standard Crimped Roofing.



Representing a Sheet of Corrugated Iron for Siding & Roofing.



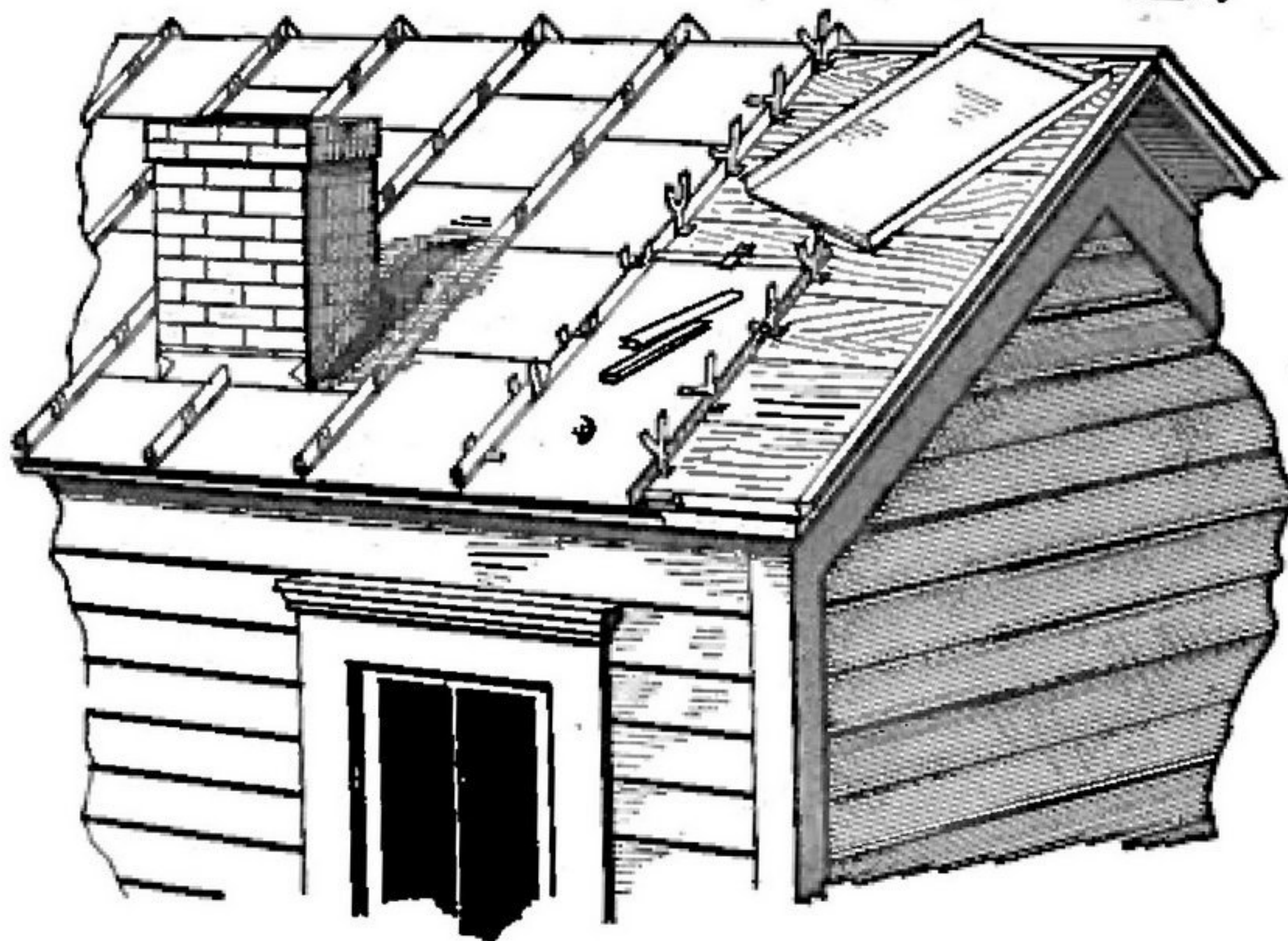
Representing a Sheet of Corrugated Iron Ceiling.

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Sheet-Iron Roofing, Siding and Ceiling.



We Claim Superiority in the following Features Possessed by our Roofing over any other Iron Roofing now in use:

1. It is made of the best iron of very fine texture, free from scale, warp or buckle. The paint will not scale off; the sheets do not rattle.
2. No pains or expense is spared to secure the best paint for sheet-iron that is known.
3. Each sheet is fastened to the roof boards at both edges alike, and also at the ends of each sheet. No other roofing is so securely fastened.
4. No holes are punched in any of the sheets for any purpose whatever, and no nails, screws or rivets are used through the sheets.
5. Each sheet is perfectly free to expand and contract with every change of the temperature without affecting the seams or loosening the fastenings.
6. It can therefore be made perfectly tight on even flat roofs. It is a removable roof. Any single sheet can be taken out, or the whole roof can be taken off, and used again without waste or loss, and without the use of any special tools. No other roofing possesses this feature.
7. This roofing is adapted to all classes of buildings and styles of roof. To the farmers it gives security from storms, fire or lightning to house or barn. To the manufacturer it gives a roof, durable and cheap, for either permanent or temporary use, for factory or warehouse. To the builder and contractor a roof that any ordinary mechanic can apply, as no extra or expensive tools are needed in putting it on.

CRIMPED IRONS FOR ROOFING AND SIDING

Equal corrugated Iron in strength and stiffness; take up less stock, and are easier to cut and fit. The sheets have one or two crimps between the crimps on each edge.

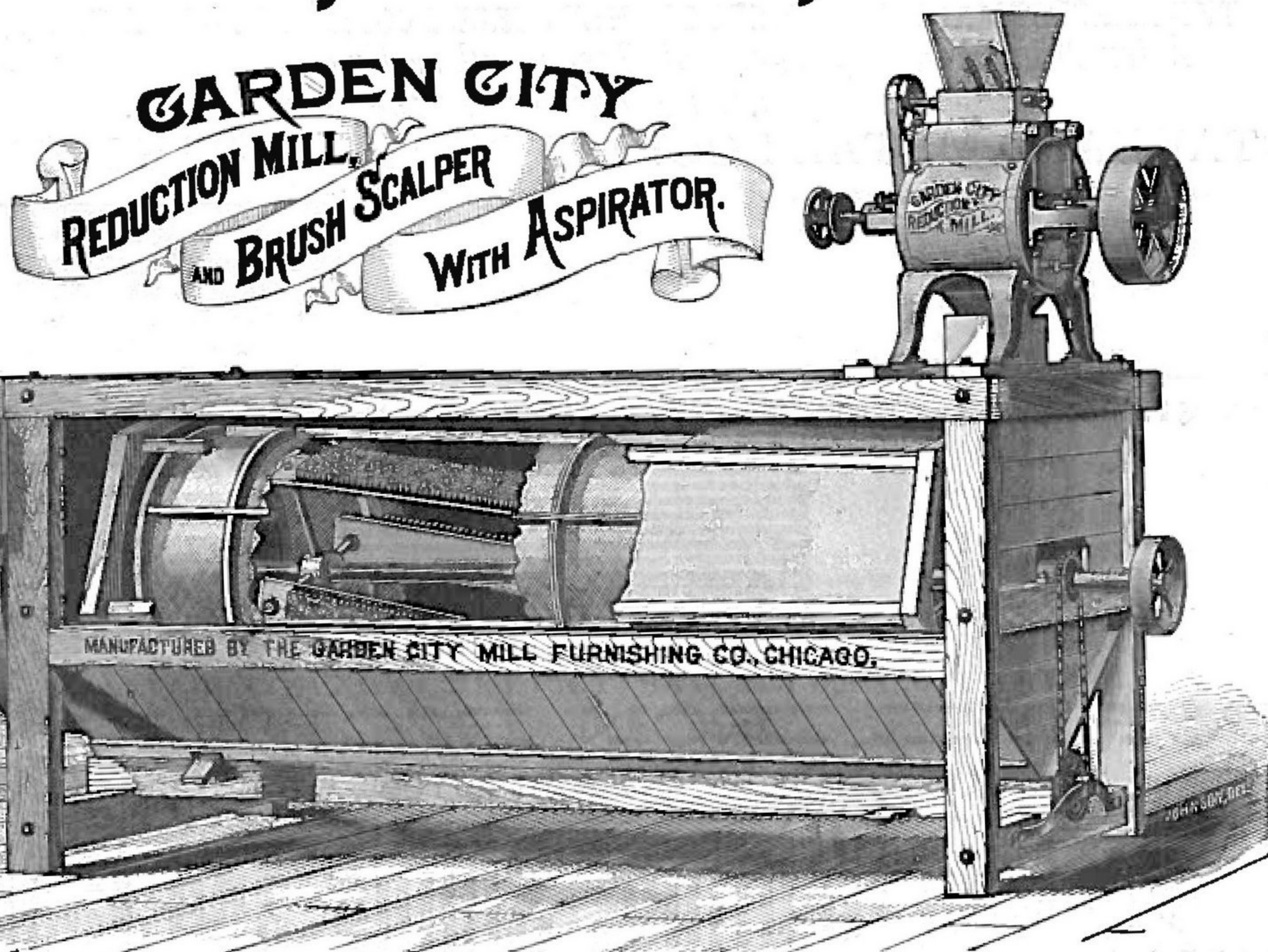
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In panels, ornamental, fire-proof; will not warp and crack as wood or fall off as plaster. Just the thing for your office and wareroom.

A. NORTHROP & CO.,

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VENI, VIDI, VICI.



Rolls Will Come, and Rolls Will Go, but the Garden City System of Milling Will Stay Forever.

WHAT IS THAT SYSTEM?

Milling on thoroughly cleaned wheat. Not cleaned as most millers consider it, but cleaned in such a manner that the seam impurities and germ are removed before the flouring operation is begun.

HOW CAN THIS BE DONE?

By using the Garden City Break Machine to split the wheat, and the Garden City Brush Scalper to brush the half kernels.

HOW MUCH BREAK FLOUR? Less than one per cent.

RESULTS.

Milling on wheat cleaned in this manner means fully as good a grade of flour from BUHRS as from Rolls.

WHY?

If all the impurities and germ are removed from the wheat, it is immaterial what method is employed to reduce it to flour, so far as color is concerned.

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In successful operation in over EIGHT HUNDRED MILLS.

INVESTIGATE AND BE CONVINCED.

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MANUFACTURERS FLOUR SACKS.

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Now Is Your Chance!

In order to reduce stock, we will give SPECIAL CASH DISCOUNTS on Belting, Elevator Cups and all kinds of Mill Supplies.

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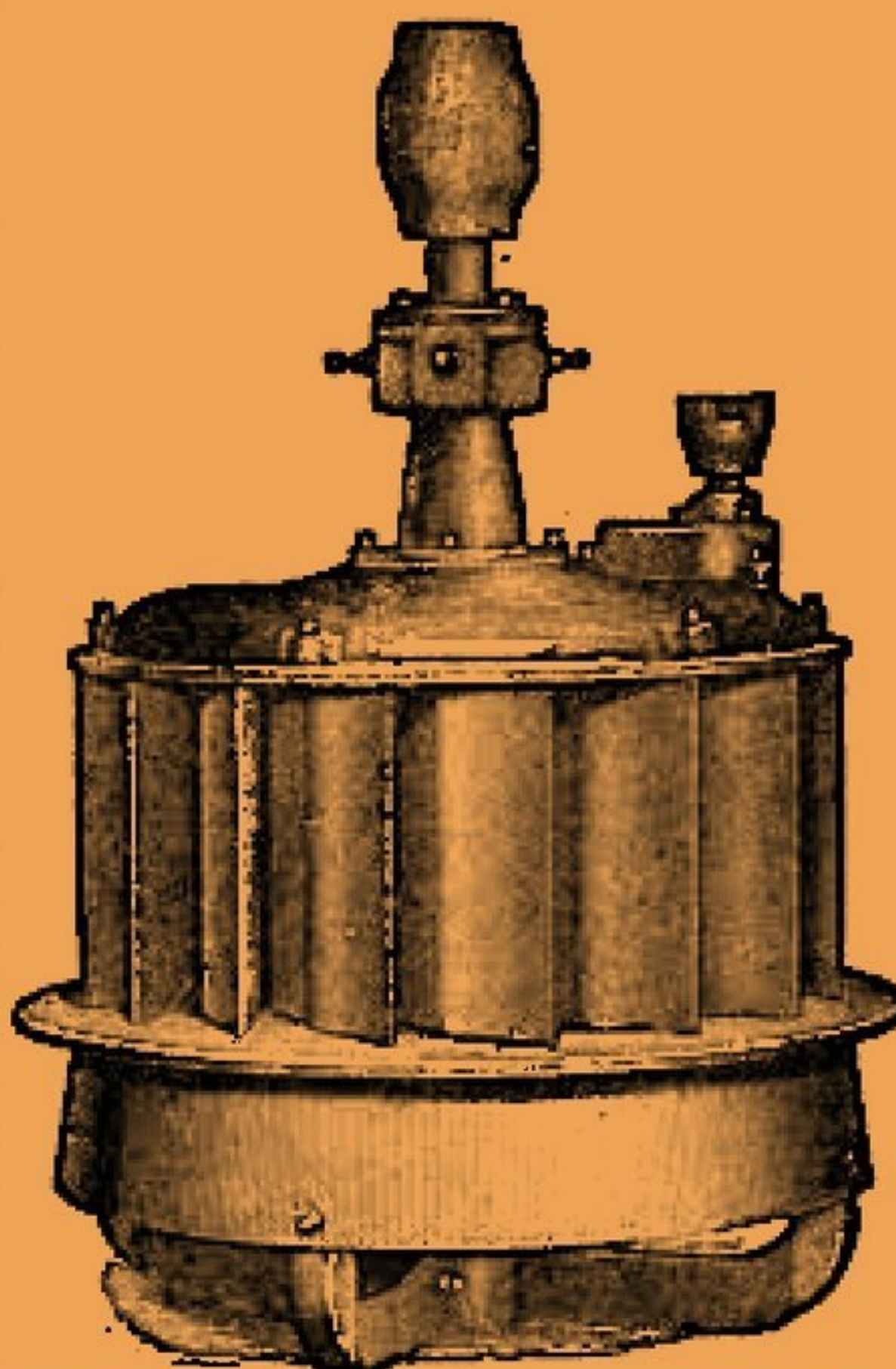
Is gaining favor every day. Over 13,000 sold in one day in three different states. My capacity in my new shop is 6,000 per week. I carry 30,000 in stock and can take care of any size order.

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Size Wheel.	Head in Feet.	Horse Power.	Per cent. Useful Effect.
15-inch.	18.06	80.17	89.82
17 "	17.96	86.85	89.51
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25 "	17.79	67.72	85.30
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Such results should command the attention of discriminating buyers.

We also continue to manufacture and sell, at low prices, the

Eclipse Double Turbine,

Widely known as a thoroughly reliable wheel.

State your requirements, and send for Catalogue to

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The best Pulley for all Practical purposes ever placed on the market. It is the **LIGHTEST, STRONGEST** and best balanced. We are prepared to make whole or split Pulleys, in even inches, from 10 to 36 inches in diameter, any width of face.

Scientific test at Franklin Institute shows slippage of belt to be 15 per cent. less than on cast-iron pulley.

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CENTRAL IRON WORKS.

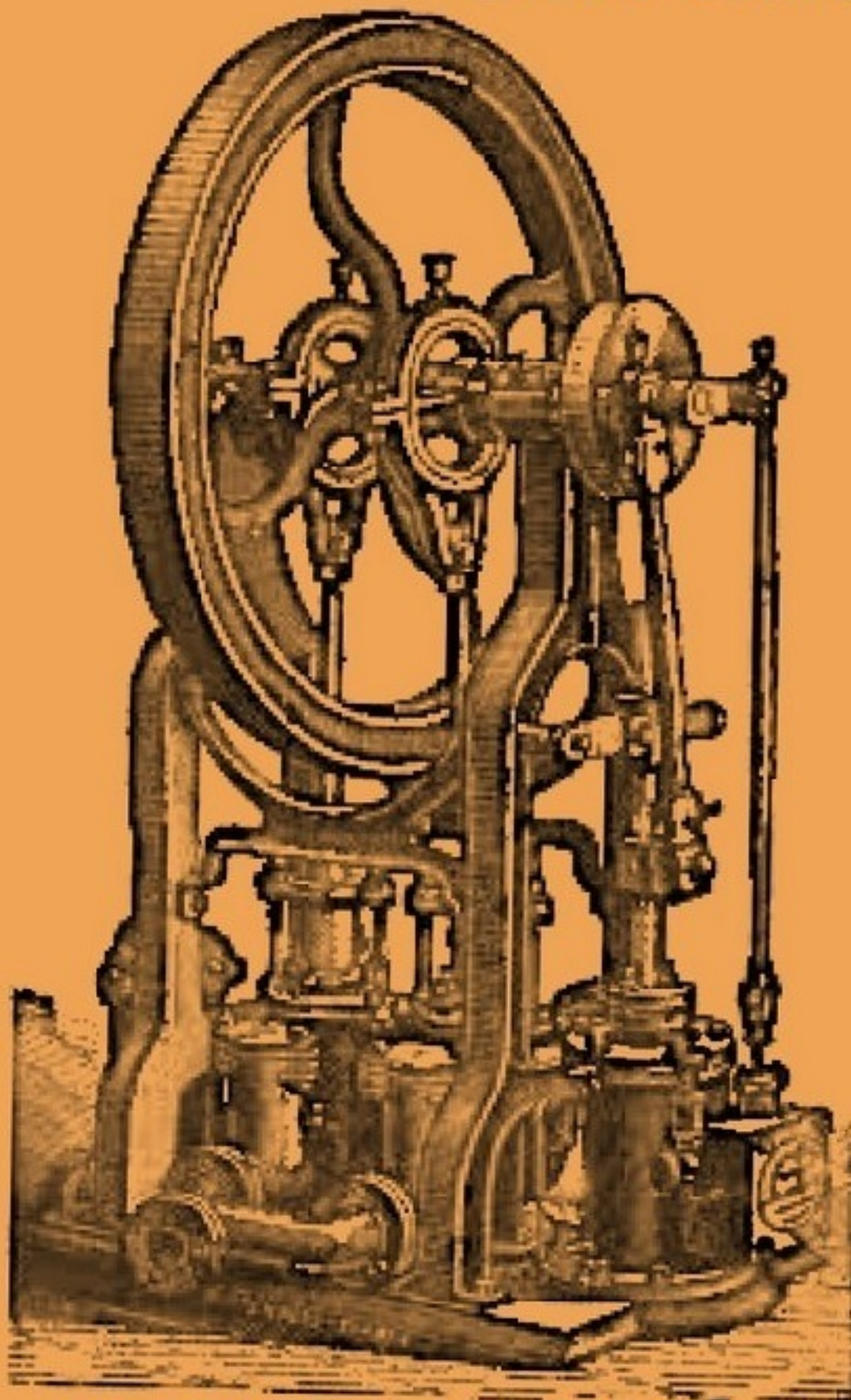
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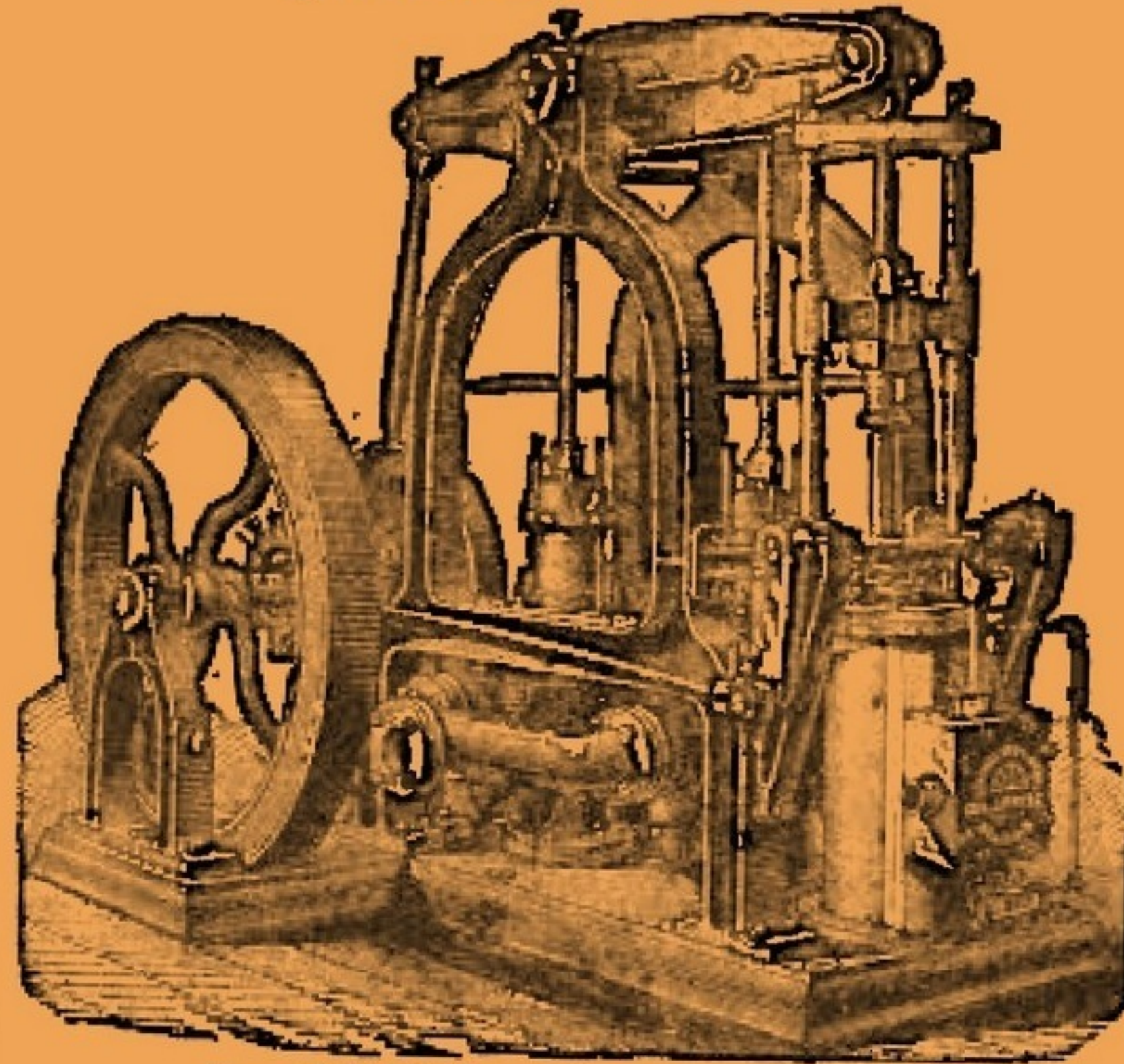
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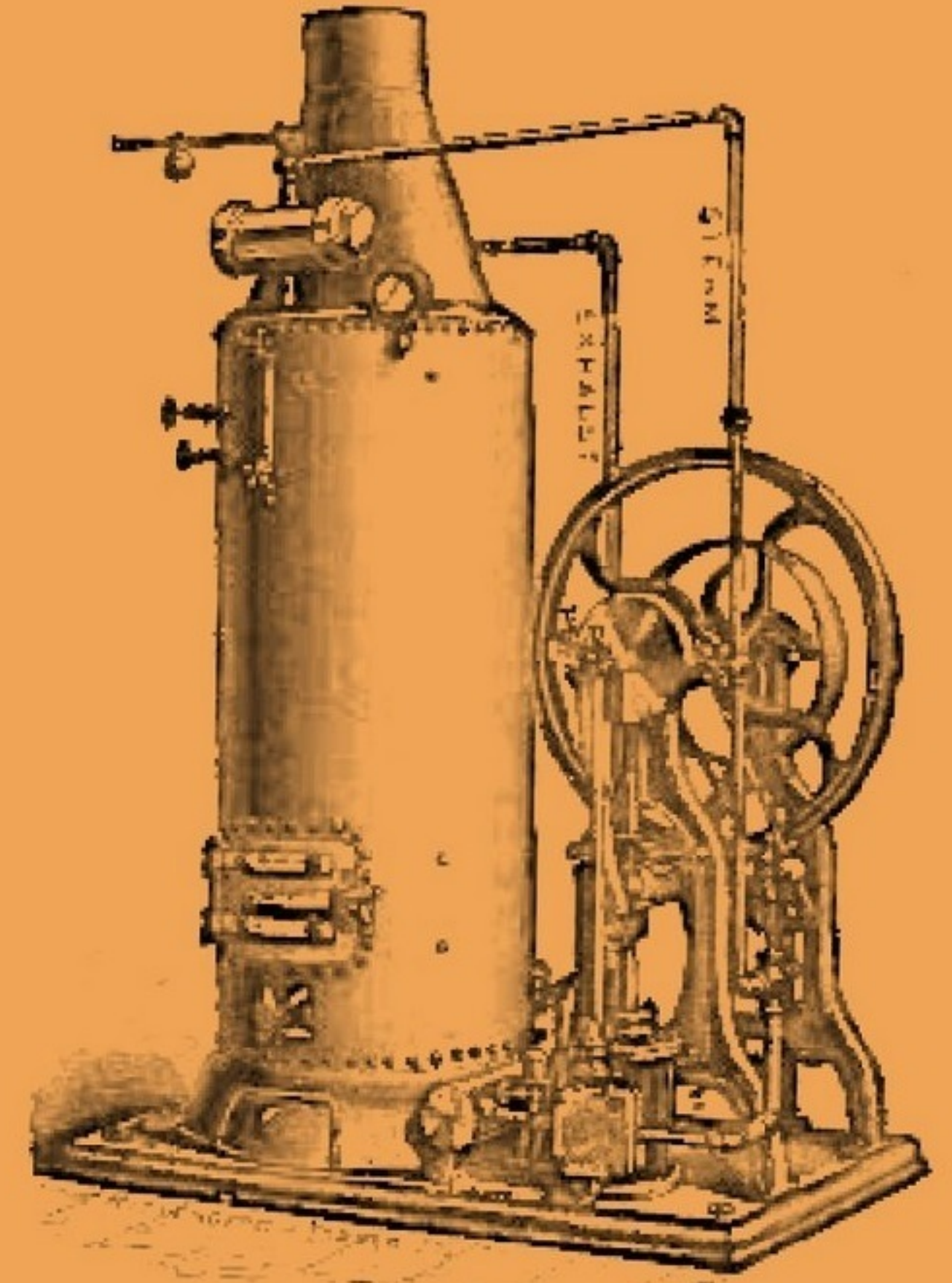
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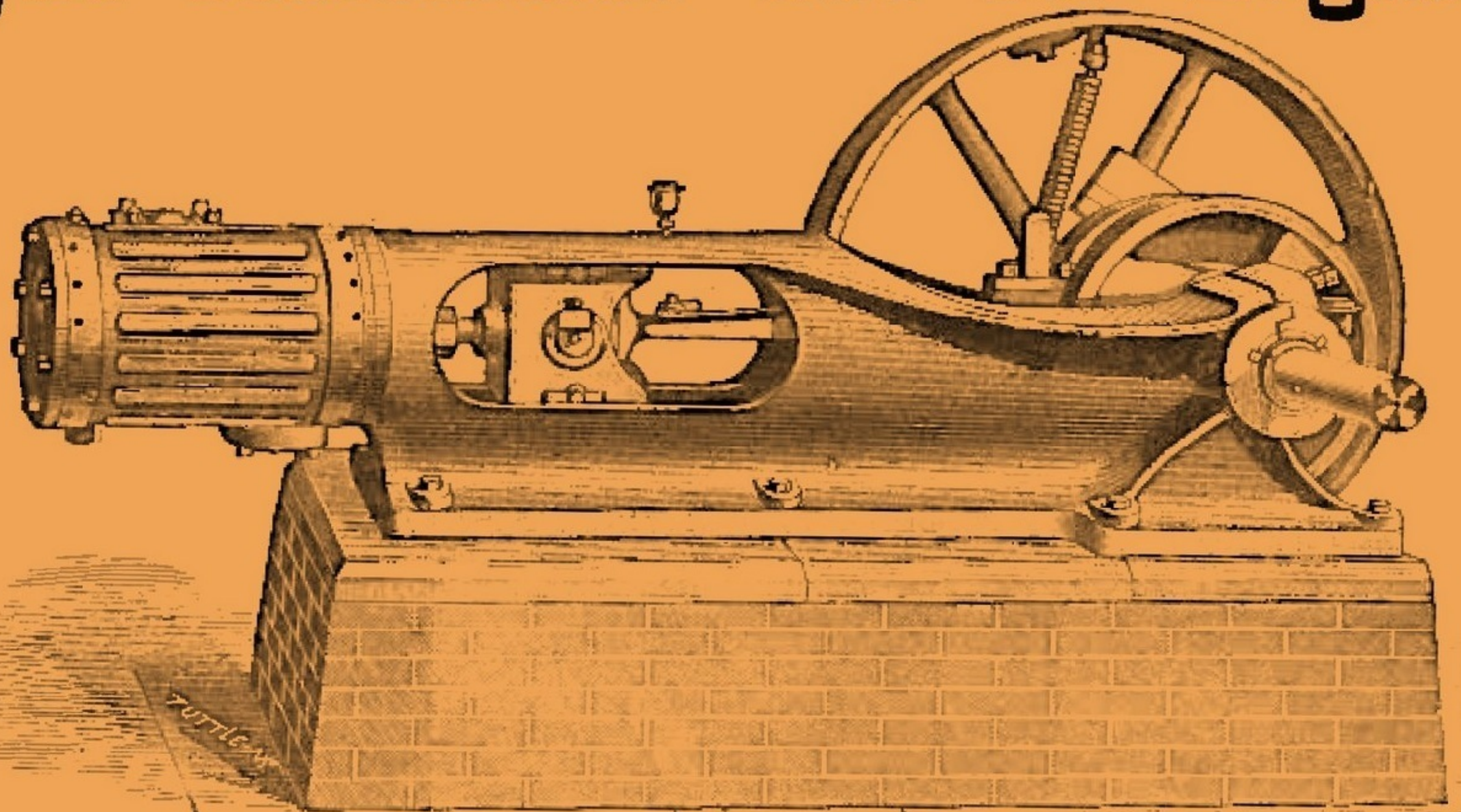
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